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47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 159.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

A letter, dated the 29th ultimo, from the Secretary of War, inclosing copy of a communication from the Mississippi River Commission, in which the commission recommends that an appropriation may be made of $1,010,000 *for "closing existing gaps in levees," in addition to the like sum for which an estimate has already been submitted.*

APRIL 18, 1882.—Read and ordered to lie on the table and be printed.

To the Senate and House of Representatives :

I transmit herewith a letter, dated the 29th ultimo, from the Secretary of War, inclosing copy of a communication from the Mississippi River Commission, in which the commission recommends that an appropriation may be made of $1,010,000 for "closing existing gaps in levees," in addition to the like sum for which an estimate has already been submitted.

The subject is one of such importance that I deem it proper to recommend early and favorable consideration of the recommendations of the commission. Having possession of and jurisdiction over the river, Congress, with a view of improving its navigation and protecting the people of the valley from floods, has for years caused surveys of the river to be made, for the purpose of acquiring knowledge of the laws that control it and of its phenomena. By act approved June 28, 1879, the Mississippi River Commission was created, composed of able engineers. Section 4 of the act provides that "it shall be the duty of said commission to take into consideration and mature such plan or plans and estimates as will correct permanently, locate and deepen the channel, and protect the banks of the Mississippi River; improve and give safety and ease to the navigation thereof; prevent destructive floods; promote and facilitate commerce, trade, and the postal service."

The constitutionality of a law making appropriations in aid of these objects cannot be questioned. While the report of the commission submitted and the plans proposed for the river's improvement seem justified as well on scientific principles as by experience and the approval of the people most interested, I desire to leave it to the judgment of Congress to decide upon the best plan for the permanent and complete improvement of the navigation of the river, and for the protection of the valley.

The immense losses and widespread suffering of the people dwelling near the river induce me to urge upon Congress the propriety of not

only making an appropriation to close the gaps in the levees occasioned by the recent floods, as recommended by the commission, but that Congress should inaugurate measures for the permanent improvement of the navigation of the river and security of the valley. It may be that such a system of improvement would as it progressed require the appropriation of twenty or thirty millions of dollars; even such an expenditure, extending as it must over several years, cannot be regarded as extravagant in view of the immense interest involved. The safe and convenient navigation of the Mississippi is a matter of concern to all sections of the country; but to the Northwest with its immense harvests needing chief transportation to the sea, and to the inhabitants of the river valley whose lives and property depend upon the proper construction of the safeguards which protect them from the floods, it is of vital importance that a well-matured and comprehensive plan for improvement should be put into operation with as little delay as possible. The cotton product of the region subject to the devastating floods is a source of wealth to the nation and of great importance in keeping the balances of trade in our favor.

It may not be inopportune to mention that this government has imposed and collected some seventy millions of dollars by a tax on cotton, in the production of which the population of the lower Mississippi is largely engaged, and it does not seem inequitable to return a portion of this tax to those who contributed it, particularly as such an action will also result in an important gain to the country at large, and especially so to the great and rich States of the Northwest and the Mississippi Valley.

CHESTER A. ARTHUR.

EXECUTIVE MANSION,
April 17, 1882.

WAR DEPARTMENT,
Washington City, March 30, 1882.

To the PRESIDENT:

I have the honor to transmit herewith copy of a letter, dated the 22d instant, from the Mississippi River Commission, recommending that, in view of the extraordinary floods now prevailing in the valley of the Mississippi River and the numerous and extensive breaks in the levees which have already been produced thereby, and the probability that many others will take place before the waters subside, the estimate heretofore submitted by the commission for "closing existing gaps in levees," amounting to $1,010,000 for the next fiscal year (see page 148, Book of Estimates for 1883), be increased to $2,020,000.

In view of the facts stated by the commission, I recommend that the communication of the commission be transmitted to Congress.

I am, sir, very respectfully, your obedient servant,

ROBERT T. LINCOLN,
Secretary of War.

WASHINGTON, *March* 22, 1882.

Hon. ROBERT T. LINCOLN,
Secretary of War,
Washington, D. C.

SIR: The undersigned, members of the Mississippi River Commission, have the honor to represent that in view of the extraordinary floods now prevailing in the Valley of the Mississippi River, and the numerous

and extensive breaks in the levees which have already been produced thereby, and the probability that many others will take place before the waters subside, it seems proper that the estimates heretofore submitted by the commission, for closing breaks in the levees as accessory to other contemplated works of channel improvement, should be increased.

Those estimates having been based upon the report of the levee commission of 1875, will, it is thought, fall greatly below the amount that will be required to close the old crevasses and such as may be found by the present floods.

From such information as we have been able to procure from residents of the valley of the Lower Mississippi, now in this city, and from reports in the newspapers, we are of the opinion that the aggregate dimensions of the breaks existing in 1875 will be more than doubled during the present overflow.

It is therefore respectfully recommended that the former estimate of the commission, amounting to $2,020,000, for closing "existing gaps" in the levees, be increased to $4,040,000.

It is believed that one-half of this sum, or $2,020,000, can be economically and judiciously expended during the next fiscal year in closing gaps in localities where the navigation of the river will be benefited by such closure.

This supplementary estimate adds $1,010,000 to the aggregate estimate for next fiscal year, submitted by the Mississippi River Commission, in its report of November 25, 1881, for works of channel improvement.

Very respectfully, your obedient servant,

Q. A. GILLMORE,
Lt. Col. Eng's. Bvt. Maj. Gen. Pres't Miss. River Commission.
JAS. B. EADS.

Sent through the Chief of Engineers, U. S. A.

P. S.—Four members of the commission, not present in Washington, have signified their approval of the foregoing increased estimate by telegrams, viz, Maj. Charles R. Suter, U. S. Corps of Engineers, Mr. Henry Mitchell, U. S. Coast and Geodetic Survey, Mr. B. M. Harrod, and R. S. Taylor.

Q. A. GILLMORE,
Lt. Col. Eng's, Bvt. Maj. Gen., Pres't Miss. River Commission.

[First indorsement.]

OFFICE CHIEF OF ENGINEERS, U. S. ARMY,
March 27, 1882.

Respectfully forwarded to the honorable the Secretary of War.

This paper was left at this office on the 23d instant, by General Gillmore, to await the signature of Mr. Eads, by whom it was signed this morning.

H. G. WRIGHT,
Chief of Engineers, Brig. & Bvt. Maj. Gen.

47TH CONGRESS, 1st Session. } SENATE. { Ex. DOC. No. 160.

MESSAGE

FROM

THE PRESIDENT OF THE UNITED STATES,

TRANSMITTING

A report from the Secretary of State, and its accompanying papers, containing the international regulations for preventing collisions at sea.

APRIL 18, 1882.—Read and referred to the Committee on Commerce, and ordered to be printed.

To the Senate:

I transmit herewith a report from the Secretary of State, and its accompanying papers, concerning the international regulations for preventing collisions at sea; and I earnestly commend this important subject to the early and favorable consideration of Congress.

CHESTER A. ARTHUR.

EXECUTIVE MANSION, *April* 17, 1882.

DEPARTMENT OF STATE,
Washington, April 12, 1882.

To the President:

The Secretary of State has the honor to lay before the President, for communication to Congress, the following report in relation to the international regulations for preventing collisions at sea:

On the 13th of April, 1876, the British minister at this capital submitted for the consideration of this government certain proposed modifications of the international regulations for preventing collisions at sea.

This communication gave rise to an extended correspondence between this Department, and the British legation, and the Secretary of the Treasury, which resulted in several modifications of the proposed regulations, whereby they were brought into accord with the Revised Statutes of the United States on the subject, except in the slight particulars indicated in the letter of the Secretary of the Treasury herewith transmitted, dated October 2, 1878. (See also section 4233 United States Revised Statutes.)

On the 9th of October, 1878, Mr. Seward, Acting Secretary of State, in communicating to the British minister a copy of the above-named letter from the Treasury Department, said:

> With reference to the provision of paragraph A [of Rule 15] of the Revised Statutes of the United States prescribing that steam vessels shall sound a steam whistle at intervals of not more than *one* minute, I have to state that the attention of the proper committee of Congress will be called to the propriety of amending that provision in harmony with the proposed international rules of the road, should the same be adopted by the several maritime nations. Meanwhile it is observed that the provisions of Rule 25 leave the local laws operative in the waters of the United States.

This communication from Mr. Seward, notwithstanding the explicit reservations contained in it, seems to have been understood by the British Government as intended to give the assent of our government to the proposed international regulations. Accordingly, on the 8th of October, 1879, Sir Edward Thornton, the British minister at this capital, submitted for the consideration of this government a proposition that the maritime powers which were parties to the proposed international regulations for preventing collisions at sea should fix the 1st day of September, 1880, as the day on which the same should go into effect.

Upon the receipt of the British minister's note this Department brought the subject to the attention of the Secretaries of the Treasury and Navy, with a view to having appropriate action taken in reference thereto before the date at which it was proposed that the regulations should go into effect, but it was found that nothing could be done without further legislation by Congress.

Meanwhile the other maritime powers having assented to the proposed date, the regulations went into effect on the 1st day of September, 1880, except as to the United States. On the 23d of April, 1880, however, Sir Edward Thornton notified Mr. Evarts that Her Majesty's Government had suspended the operation of Article X of the new regulations until the 1st of September, 1881; and afterwards, on the 30th of April, 1881, Sir Edward Thornton, by direction of Earl Granville, submitted for the consideration of this government a *new* article as a substitute for the suspended Article X. I transmit herewith a copy of that note and its accompaniments, in which the reasons urged by the British Government for the adoption of the new Article X are set forth.

The accompanying correspondence and documents will show the extent to which this subject has occupied the executive branch of this government, and the difficulties which have been encountered in dealing with it, as illustrated by the action which the several departments have found it necessary to take, in consequence of the want of appropriate Congressional legislation in reference to the matter.

By comparing the international regulations (see inclosure to Sir Edward Thornton's note of October 8, 1879) with the provisions of the Revised Statutes of the United States on the subject, it will be seen that the differences between the codes are very slight.

It is not thought that any objections of weight can be made to the amendments which are necessary to make the domestic legislation of the United States conform to the rules which are now uniformly recognized by all the other maritime powers of the world. Aside from the general reasons which should induce the United States to accede to the international rules of the road, the fact that in the present state of the law on the subject the interests of our commerce are liable to be very injuriously affected in collision suits in admiralty, renders prompt action by Congress very necessary.

A draft of an act embodying the legislation on this subject which, in the opinion of this Department, is necessary at this time, is herewith submitted. It will be observed that owing to the suspension of Article X of the international regulations in relation to lights for open fishing-boats, and to the pending negotiations for a new article on the subject, the draft in question proposes to re-enact the present provisions of our statutes as to lights for such boats.

Respectfully submitted.

FRED'K T. FRELINGHUYSEN.

AN ACT to establish rules for preventing collisions at sea and on the waters of the United States of America.

SECTION 1. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That the following rules for preventing collisions on the water shall be followed in the navigation of vessels of the navy and of the mercantile marine of the United States:

ARTICLE 1. In the following rules every steamship which is under sail and not under steam, is to be considered a sailing ship; and every steamship which is under steam, whether under sail or not, is to be considered a ship under steam.

RULES CONCERNING LIGHTS.

ART. 2 The lights mentioned in the following articles, numbered 3, 4, 5, 6, 7, 8, 9, 10, and 11, and no others, shall be carried in all weathers, from sunset to sunrise:

ART. 3. A sea-going steamship, when under way, shall carry—

(*a*) On or in front of the foremast, at a height above the hull of not less than twenty feet, and if the breadth of the ship exceeds twenty feet, then at a height above the hull not less than such breadth, a bright white light, so constructed as to show an uniform and unbroken light over an arc of the horizon of twenty points of the compass; so fixed as to throw the light ten points on each side of the ship, viz, from right ahead to two points abaft the beam on either side; and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least five miles.

(*b*) On the starboard side, a green light, so constructed as to show an uniform and unbroken light over an arc of the horizon of ten points of the compass; so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side; and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(*c*) On the port side, a red light, so constructed as to show an uniform and unbroken light over an arc of the horizon of ten points of the compass; so fixed as to throw the light from right ahead to two points abaft the beam on the port side; and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(*d*) The said green and red side lights shall be fitted with inboarded screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

ART. 4. A steamship, when towing another ship, shall, in addition to her side lights, carry two bright white lights in a vertical line, one over the other, not less than three feet apart, so as to distinguish her from other steamships. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light which other steamships are required to carry.

ART. 5. A ship, whether a steamship or a sailing ship, when employed either in laying or in picking up a telegraph cable, or which, from any accident, is not under command, shall at night carry in the same position as the white light which steamships are required to carry, and, if a steamship, in place of that light, three red lights in globular lanterns, each not less than ten inches in diameter, in a vertical line, one over the other, not less than three feet apart, and shall by day carry, in a vertical line, one over the other, not less than three feet apart, in front of but not lower than her foremast head, three black balls or shapes, each two feet in diameter.

These shapes and lights are to be taken by approaching ships as signals that the ship using them is not under command, and cannot therefore get out of the way.

The above ships, when not making any way through the water, shall not carry the side lights, but when making way shall carry them.

ART. 6. A sailing ship under way, or being towed, shall carry the same lights as are provided by Article 3 for a steamship under way, with the exception of the white light, which she shall never carry.

ART. 7. Whenever, as in the case of small vessels during bad weather, the green and red side lights cannot be fixed, these lights shall be kept on deck, on their respective sides of the vessel, ready for use; and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side, nor the red light on the starboard side.

To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

ART. 8. A ship, whether a steamship or a sailing ship, when at anchor, shall carry, where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light, in a globular lantern of not less than eight inches in diameter, and so constructed as to show a clear, uniform, and unbroken light visible all round the horizon, at a distance of at least one mile.

ART. 9. A pilot vessel, when engaged on her station on pilotage duty, shall not carry the lights required for other vessels, but shall carry a white light at the mast-head visible all round the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals, which shall never exceed fifteen minutes.

A pilot vessel, when not engaged on her station on pilotage duty, shall carry lights similar to those of other ships.

ART. 10. Open boats shall not be required to carry the side lights required for other vessels, but shall, if they do not carry such lights, carry a lantern having a green slide on one side and a red slide on the other side; and on the approach of or to other vessels, such lantern shall be exhibited in sufficient time to prevent collision, and in such a manner that the green light shall not be seen on the port side, nor the red light on the starboard side. Open boats, when at anchor or stationary, shall exhibit a bright white light. They shall not, however, be prevented from using a flare-up in addition, if considered expedient.

ART. 11. A ship which is being overtaken by another shall show from her stern to such last-mentioned ship a white light or a flare-up light.

SOUND SIGNALS FOR FOG, &C.

ART. 12. A steamship shall be provided with a steam whistle or other efficient steam signal, so placed that the sound may not be intercepted by any obstructions, and with an efficient fog-horn, to be sounded by a bellows or other mechanical means, and also with an efficient bell. A sailing ship shall be provided with a similar fog-horn and bell.

In fog, mist, or falling snow, whether by day or night, the signals described in this article shall be used as follows, that is to say:

(*a*) A steamship under way shall make with her steam-whistle, or other steam-sound signal, at intervals of not more than two minutes, a prolonged blast.

(*b*) A sailing ship under way shall make with her fog-horn, at intervals of not more than two minutes, when on the starboard tack, one blast, when on the port tack, two blasts in succession, and when with the wind abaft the beam, three blasts in succession.

(*c*) A steamship and a sailing ship, when not under way, shall, at intervals of not more than two minutes, ring the bell.

SPEED OF SHIPS TO BE MODERATE IN FOG, &C.

ART. 13. Every ship, whether a sailing ship or steamship, shall, in a fog, mist, or falling snow, go at a moderate speed.

STEERING AND SAILING RULES.

ART. 14. When two sailing ships are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other as follows, viz:

(*a*) A ship which is running free shall keep out of the way of a ship which is close hauled.

(*b*) A ship which is close hauled on the port tack shall keep out of the way of a ship which is close hauled on the starboard tack.

(*c*) When both are running free with the wind on different sides, the ship which has the wind on the port side shall keep out of the way of the other.

(*d*) When both are running free with the wind on the same side, the ship which is to windward shall keep out of the way of the ship which is to leeward.

(*e*) A ship which has the wind aft shall keep out of the way of the other ship.

ART. 15. If two ships under steam are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other.

This article only applies to cases where ships are meeting end on, or nearly end on, in such a manner as to involve risk of collision, and does not apply to two ships which must, if both keep on their respective courses, pass clear of each other.

The only cases to which it does apply are, when each of the two ships is end on, or nearly end on, to the other; in other words, in cases in which, by day, each ship sees the masts of the other in a line, or nearly in a line, with her own; and by night, to cases in which each ship is in such a position as to see both the side lights of the other.

It does not apply, by day, to cases in which a ship sees another ahead crossing her own course, or by night, to cases where the red light of one ship is opposed to the red light of the other, or where the green light of one ship is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.

ART. 16. If two ships under steam are crossing, so as to involve risk of collision, the ship which has the other on her own starboard side shall keep out of the way of the other.

ART. 17. If two ships, one of which is a sailing ship and the other a steamship, are

proceeding in such directions as to involve risk of collision, the steamship shall keep out of the way of the sailing ship.

ART. 18. Every steamship when approaching another ship so as to involve risk of collision, shall slacken her speed or stop and reverse if necessary.

ART. 19. In taking any course authorized or required by these regulations, a steamship under way may indicate that course to any other ship which she has in sight by the following signals on her steam whistle, viz:

One short blast to mean "I am directing my course to starboard;" two short blasts to mean, "I am directing my course to port;" three short blasts to mean, "I am going full speed astern."

The use of these signals is optional; but if they are used, the course of the ship must be in accordance with the signal made.

ART. 20. Notwithstanding anything contained in any preceding article, every ship, whether a sailing ship or a steamship, overtaking any other, shall keep out of the way of the overtaken ship.

ART. 21. In narrow channels every steamship shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such ship.

ART. 22. Where by the above rules one of two ships is to keep out of the way, the other shall keep her course.

ART. 23. In obeying and construing these rules due regard shall be had to all dangers of navigation; and to any special circumstances which may render a departure from the above rule necessary in order to avoid immediate danger.

NO SHIP UNDER ANY CIRCUMSTANCES TO NEGLECT PROPER PRECAUTIONS.

ART. 24. Nothing in these rules shall exonerate any ship, or the owner or master or crew thereof from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

RESERVATION OF RULES FOR HARBORS AND INLAND NAVIGATION.

ART. 25. Nothing in these rules shall interfere with the operation of a special rule, duly made by local authority, relative to the navigation of any harbor, river, or inland navigation.

SPECIAL LIGHTS FOR SQUADRONS AND CONVOYS.

ART. 26. The exhibition of any light on board of a vessel of war of the United States may be suspended whenever, in the opinion of the Secretary of the Navy, the commander-in-chief of a squadron, or the commander of a vessel acting singly, the special character of the service may require it.

DOMESTIC RULES LIGHTS.

ART. 27. All steam vessels, other than ocean going steamers, and steamers carrying sail, shall, when under way, carry on the starboard and port sides lights of the same character and construction, and in the same position as are prescribed for side lights by Rule 3, except in the case provided in Rule 28.

ART. 28. River steamers navigating waters flowing into the Gulf of Mexico and their tributaries shall carry the following lights, namely: One red light on the outboard-side of the port smoke-pipe, and one green light on the outboard-side of the starboard smoke-pipe. Such lights shall show both forward and abeam on their respective sides.

ART. 29. All coasting steam vessels, and steam vessels other than ferry-boats, and vessels otherwise expressly provided for, navigating the bays, lakes, rivers, or other inland waters of the United States, except those mentioned in Rule 27, shall carry the red and green lights as prescribed for ocean-going steamers; and, in addition thereto, a central range of two white lights, the after light being carried at an elevation of at least fifteen feet above the light at the head of the vessel. The head-light shall be so constructed as to show a good light through twenty points of the compass, namely, from right ahead to two points abaft the beam on either side of the vessel, and the after light so as to show all around the horizon. The lights for ferry-boats shall be regulated by such rules as the board of supervising inspectors of steam vessels shall prescribe.

FOG SIGNALS.

ART. 30. Coal-boats, trading-boats, produce-boats, canal-boats, oyster-boats, fishing-

boats, rafts, or other water craft, navigating any bay, harbor, or river, by hand-power, horse-power, sail, or by the current of the river, or anchored or moored in or near the channel or fairway of any bay, harbor, or river, and not in any port, shall sound a fog-horn, or equivalent signal, which shall make a sound equal to a steam-whistle, at intervals of not more than two minutes.

SEC. 2. That section forty-two hundred and thirty-three of the Revised Statutes of the United States be, and the same is hereby, repealed.

SEC. 3. That this act shall take effect and be in force from and after its passage.

LIST OF ACCOMPANYING PAPERS.

No. 1. Mr. Sherman to Mr. Evarts, October 2, 1878.
No. 2. Sir E. Thornton to Mr. Hunter, October 8, 1879.
No. 3. Mr. Evarts to Sir E. Thornton, October 10, 1879.
No. 4. Mr. Evarts to Mr. Sherman, November 24, 1879.
No. 5. Mr. Evarts to Mr. Thompson, November 24, 1879.
No. 6. Mr. Evarts to Mr. Thompson, February 20, 1880.
No. 7. Mr. Evarts to Mr. Sherman, February 20, 1880.
No. 8. Mr. Sherman to Mr. Evarts, February 25, 1880.
No. 9. Mr. Thompson to Mr. Evarts, March 3, 1880.
No. 10. Sir E. Thornton to Mr. Evarts, April 23, 1880.
No. 11. Mr. Evarts to Mr. Thompson, April 26, 1880.
No. 12. Mr. Evarts to Mr. Sherman, April 26, 1880.
No. 13. Mr. Evarts to Sir E. Thornton, April 27, 1880.
No. 14. Mr. Thompson to Mr. Evarts, May 10, 1880.
No. 15. Mr. Hay to Mr. Sherman, June 21, 1880.
No. 16. Mr. Hay to Mr. Thompson, June 21, 1880.
No. 17. Mr. Hay to Sir E. Thornton, June 29, 1880.
No. 18. Mr. Hay to Mr. Drummond, June 30, 1880.
No. 19. Commodore Jeffers to Mr. Evarts, July 1, 1880.
No. 20. Mr. Hunter to Mr. Thompson, July 3, 1880.
No. 21. Commodore Jeffers to Mr. Evarts, August 23, 1880.
No. 22. Mr. Drummond to Mr. Evarts, August 24, 1880.
No. 23 Mr. Hay to Mr. Thompson, August 26, 1880.
No. 24. Mr. Hay to Mr. Sherman, August 27, 1880.
No. 25. Mr. French to Mr. Hay, September 2, 1880.
No. 26. Mr. Blaine to Mr. Windom, April 18, 1881.
No. 27. Mr. Blaine to Mr. Hunt, April 18, 1881.
No. 28. Mr. Hunt to Mr. Blaine, April 19, 1881.
No. 29. Mr. Windom to Mr. Blaine, April 21, 1881.
No. 30. Mr. Blaine to Mr. Hunt, April 22, 1881.
No. 31. Sir E. Thornton to Mr. Blaine, April 30, 1881.
No. 32. Mr. Hunt to Mr. Blaine, May 2, 1881.
No. 33. Mr. Blaine to Mr. Windom, May 7, 1881.
No. 34. Mr. Blaine to Mr. Windom, May 7, 1881.
No. 35. Mr. Windom to Mr. Blaine, May 9, 1881.
No. 36. Mr. Blaine to Mr. Windom, May 13, 1881.
No. 37. Mr. Blaine to Sir E. Thornton, May 13, 1881.
No. 38. Mr. Blaine to Mr. Hunt, May 17, 1881.
No. 39. Mr. Blaine to Mr. Windom, May 18, 1881.
No. 40. Mr. Hunt to Mr. Blaine, May 25, 1881.
No. 41. Mr. Windom to Mr. Blaine, May 26, 1881.
No. 42. Mr. Drummond to Mr. Blaine, July 27, 1881.
No. 43. Mr. Blaine to Mr. Drummond, August 2, 1881.
No. 44. Mr. West to Mr. Frelinghuysen, March 16, 1882.

No. 1.

Mr. Sherman to Mr. Evarts.

TREASURY DEPARTMENT,
October 2, 1878.

SIR: I have the honor to acknowledge the receipt of your letter of the 21st ultimo, referring to the correspondence in May last with this

Department, relating to proposed international regulations for preventing collisions at sea; and you inclose a copy of a note from the British minister in this country, relative to the subject, together with a copy of a paper headed "Reply to United States," and other documents. And you state that on receiving the conclusions of this Department in the premises, you will communicate them to Her Majesty's Government.

Two of the inclosures are documents marked A and B, which relate to the regulations and suggestions made by the committee appointed by the British admiralty, Board of Trade, and Trinity House, relative to the prevention of collisions at sea.

In view of the explanation made in the "Reply to United States," and which is based on the Department's suggestion of two changes in Article 12, one of which seemed to be called for to harmonize the proposed regulations with the laws of the United States, section 4233, Rule 15 *a*, Revised Statutes, the Department is of opinion that, if the statute of the United States quoted may not be considered an obstacle, the adoption of the rules, as revised July 10, 1878, marked B, should not be hazarded by any further suggestions.

It is observed that the provisions of Rule 25 leave the local laws operative in the waters of the United States. And, taking a general view of the whole matter, the Department is of opinion that the adoption of these "rules of the road" by the several maritime nations will result in mutual advantage, and tend to lessen the dangers of navigation on the high seas.

Very respectfully,

JOHN SHERMAN,
Secretary.

No. 2.

Sir Edward Thornton to Mr. Hunter.

WASHINGTON, *October* 8, 1879.

SIR: In compliance with an instruction from the Marquis of Salisbury, I have the honor to transmit herewith a copy of an order of Her Majesty in council, dated the 14th of August last, containing the revised regulations for the prevention of collisions at sea, which, according to the terms of the order, are to come into force, so far as regards the British Royal Navy and mercantile marine on the 1st of September, 1880.

In communicating this order to the Government of the United States, I am directed by his lordship to state that Her Majesty's Government has reason to believe that the governments of the foreign countries named in the second schedule attached to the order will agree that the date fixed will allow of a sufficient time for the publication and study of the new regulations, and that those governments will accordingly take steps to give the regulations the force of law as regards their respective ships by the 1st of September, 1880. In the event, however, that the Government of the United States should have occasion to prefer a different date for the carrying into force of the regulations, Her Majesty's Government will be ready to reconsider the question with a view to an alteration in the date.

I have, &c.,

EDW'D THORNTON.

FIRST SCHEDULE.

REGULATIONS FOR PREVENTING COLLISIONS AT SEA.

ARTICLE 1.

Preliminary.

In the following rules every steamship which is under sail and not under steam is to be considered a sailing ship; and every steamship which is under steam, whether under sail or not, is to be considered a ship under steam.

ARTICLE 2.

Rules concerning lights.

The lights mentioned in the following articles, numbered 3, 4, 5, 6, 7, 8, 9, 10, and 11, and no others, shall be carried in all weathers from sunset to sunrise.

ARTICLE 3.

A seagoing steamship when under way shall carry—

(*a*) On or in front of the foremast, at a height above the hull of not less than 20 feet, and if the breadth of the ship exceeds 20 feet then at a height above the hull not less than such breath, a bright white light, so constructed as to show an uniform and unbroken light over an arc of the horizon of 20 points of the compass; so fixed as to throw the light 10 points on each side of the ship, viz, from right ahead to two points abaft the beam on either side; and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least five miles.

(*b*) On the starboard side, a green light so constructed as to show an uniform and unbroken light over an arc of the horizon of 10 points of the compass; so fixed as to throw the light from right ahead to 2 points abaft the beam on the starboard side; and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(*c*) On the port side, a red light, so constructed as to show an uniform and unbroken light over an arc of the horizon of 10 points of the compass; so fixed as to throw the light from right ahead to 2 points abaft the beam on the port side; and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(*d*) The said green and red side lights shall be fitted with inboard screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

ARTICLE 4.

A steamship, when towing another ship, shall, in addition to her side lights, carry two bright white lights in a vertical line one over the other, not less than three feet apart, so as to distinguish her from other steamships. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light which other steamships are required to carry.

ARTICLE 5.

A ship, whether a steamship or a sailing ship, when employed either in laying or in picking up a telegraph cable, or which from any accident is not under command, shall at night carry, in the same position as the white light which steamships are required to carry, and, if a steamship, in place of that light, three red lights in gobular lanterns, each not less than 10 inches in diameter, in a vertical line one over the other, not less than three feet apart; and shall by day carry in a vertical line one over the other, not less than three feet apart, in front of but not lower than her foremast head, three black balls or shapes, each two feet in diameter.

These shapes and lights are to be taken by approaching ships as signals that the ship using them is not under command, and cannot therefore get out of the way.

The above ships, when not making any way through the water, shall not carry the side lights, but when making way shall carry them.

ARTICLE 6.

A sailing ship under way, or being towed, shall carry the same lights as are provided by Article 3 for a steamship under way, with the exception of the white light, which she shall never carry.

ARTICLE 7.

Whenever, as in the case of small vessels during bad weather, the green and red side lights cannot be fixed, these lights shall be kept on deck, on their respective sides of the vessel, ready for use; and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side.

To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

ARTICLE 8.

A ship, whether a steamship or a sailing ship, when at anchor, shall carry, where it can best be seen, but at a height not exceeding 20 feet above the hull, a white light, in a globular lantern of not less than eight inches in diameter, and so constructed as to show a clear, uniform, and unbroken light visible all round the horizon at a distance of at least one mile.

ARTICLE 9.

A pilot vessel, when engaged on her station on pilotage duty, shall not carry the lights required for other vessels, but shall carry a white light at the mast-head, visible all round the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals, which shall never exceed fifteen minutes.

A pilot vessel, when not engaged on her station on pilotage duty, shall carry lights similar to those of other ships.

ARTICLE 10.

(*a*) Open fishing-boats and other open boats when under way shall not be obliged to carry the side lights required for other vessels; but every such boat shall in lieu thereof have ready at hand a lantern with a green glass on the one side and a red glass on the other side; and on the approach of or to other vessels such lantern shall be exhibited, in sufficient time to prevent collision, so that the green light shall not be seen on the port side, nor the red light on the starboard side.

(*b*) A fishing-vessel, and an open boat, when at anchor, shall exhibit a bright white light.

(*c*) A fishing-vessel, when employed in drift-net fishing, shall carry on one of her masts two red lights in a vertical line one over the other, not less than three feet apart.

(*d*) A trawler at work shall carry on one of her masts two lights in a vertical line one over the other, not less than three feet apart, the upper light red and the lower green, and shall also either carry the side lights required for other vessels, or if the side lights cannot be carried, have ready at hand the colored lights, as provided in Article 7, or a lantern with a red and a green glass, as described in paragraph (*a*) of this article.

(*e*) Fishing-vessels and open boats shall not be prevented from using a flare-up in addition, if they desire to do so.

(*f*) The lights mentioned in this article are substituted for those mentioned in the 12th, 13th, and 14th articles of the convention between France and England scheduled to the British Sea Fisheries Act, 1868.

(*g*) All lights required by this article, except side lights, shall be in globular lanterns, so constructed as to show all round the horizon.

ARTICLE 11.

A ship which is being overtaken by another shall show from her stern to such last-mentioned ship a white light or a flare-up light.

ARTICLE 12.

Sound signals for fog, &c.

A steamship shall be provided with a steam-whistle or other efficient steam sound signal, so placed that the sound may not be intercepted by any obstructions, and with an efficient fog-horn to be sounded by a bellows or other mechanical means, and also with an efficient bell. A sailing ship shall be provided with a similar fog-horn and bell.

In fog, mist, or falling snow, whether by day or night, the signals described in this article shall be used as follows, that is to say:

(*a*) A steam ship under way shall make with her steam-whistle, or other steam sound signal, at intervals of not more than two minutes, a prolonged blast.

(*b*) A sailing ship under way shall make with her fog-horn, at intervals of not more than two minutes, when on the starboard tack one blast, when on the port tack two blasts in succession, and when with the wind abaft the beam three blasts in succession.

(*c*) A steamship and sailing ship, when not under way, shall, at intervals of not more than two minutes, ring the bell.

ARTICLE 13.

Speed of ships to be moderate in fog, &c.

Every ship, whether sailing ship or steamship, shall, in a fog, mist, or falling snow, go at a moderate speed.

ARTICLE 14.

Steering and sailing rules.

When two sailing ships are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other, as follows, viz:

(*a*) A ship which is running free shall keep out of the way of a ship which is close hauled.

(*b*)A ship which is close hauled on the port tack shall keep out of the way of a ship which is close hauled on the starboard tack.

(*c*) When both are running free, with the wind on different sides, the ship which has the wind on the port side shall keep out of the way of the other.

(*d*) When both are running free, with the wind on the same side, the ship which is to windward shall keep out of the way of the ship which is to leeward.

(*e*) A ship which has the wind aft shall keep out of the way of the other ship.

ARTICLE 15.

If two ships under steam are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other.

This article only applies to cases where ships are meeting end on, or nearly end on, in such a manner as to involve risk of collision, and does not apply to two ships which must, if both keep on their respective courses, pass clear of each other.

The only cases to which it does not apply are, when each of the two ships is end on, or nearly end on, to the other; in other words, to cases in which, by day, each ship sees the masts of the other in a line, or nearly in a line, with her own; and, by night, to cases in which each ship is in such a position as to see both the side lights of the other.

It does not apply, by day, to cases in which a ship sees another ahead crossing her own course; or, by night, to cases where the red light of one ship is opposed to the red light of the other, or where the green light of one ship is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.

ARTICLE 16.

If two ships under steam are crossing so as to involve risk of collision, the ship which has the other on her own starboard side shall keep out of the way of the other.

ARTICLE 17.

If two ships, one of which is a sailing ship and the other a steamship, are proceeding in such directions as to involve risk of collision, the steamship shall keep out of the way of the sailing ship.

ARTICLE 18.

Every steamship, when approaching another ship, so as to involve risk of collision, shall slacken her speed or stop and reverse if necessary.

ARTICLE 19.

In taking any course authorized or required by these regulations, a steamship under way may indicate that course to any other ship which she has in sight by the following signals on her steam-whistle, viz:

One short blast to mean "I am directing my course to starboard."

Two short blasts to mean "I am directing my course to port."

Three short blasts to mean "I am going full speed astern."

The use of these signals is optional; but if they are used the course of the ship must be in accordance with the signal made.

ARTICLE 20.

Notwithstanding anything contained in any preceding article, every ship, whether a sailing ship or a steamship, overtaking another, shall keep out of the way of the overtaken ship.

ARTICLE 21.

In narrow channels every steamship shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such ship.

ARTICLE 22.

Where, by the above rules, one of two ships is to keep out of the way, the other shall keep her course.

ARTICLE 23.

In obeying and construing these rules due regard shall be had to all dangers of navigation, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

ARTICLE 24.

No ship, under any circumstances, to neglect proper precautions.

Nothing in these rules shall exonerate any ship, or the owner, or master, or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

ARTICLE 25.

Reservation of rules for harbors and inland navigation.

Nothing in these rules shall interfere with the operation of a special rule, duly made by local authority, relative to the navigation of any harbor, river, or inland navigation.

ARTICLE 26.

Special lights for squadrons and convoys.

Nothing in these rules shall interfere with the operation of any special rules made by the government of any nation with respect to additional station and signal lights for two or more ships of war or for ships sailing under convoy.

SECOND SCHEDULE.

AUSTRIA-HUNGARY.	FRANCE.	ITALY.	RUSSIA.
BELGIUM.	GERMANY.	NETHERLANDS.	SPAIN.
CHILI.	GREAT BRITAIN.	NORWAY.	SWEDEN.
DENMARK.	GREECE.	PORTUGAL.	UNITED STATES.

No. 3.

Mr. Evarts to Sir Edward Thornton.

DEPARTMENT OF STATE,
Washington, October 10, 1879.

SIR: I have the honor to acknowledge the receipt of your note of the 8th instant, transmitting a copy of an order of Her Majesty in council, dated the 14th of August last, containing the revised regulations for the prevention of collisions at sea, which according to the terms of the order, are to come into force, so far as concerns the British Royal Navy and mercantile marine, on the 1st of September, 1880, you also communicate the belief entertained by Her Majesty's Government, that the governments of the countries named in the second schedule, attached to the order, will agree that the date fixed will allow of a sufficient time for their study, and that those governments will accordingly take steps to give the regulations the force of law as regards their respective ships by the 1st of September, 1880, but that if the Government of the United States should have occasion to prefer a different date for the carrying into force of the regulation Her Majesty's Government will be ready to reconsider the question with a view to an alteration in the date.

In reply, I have to say that the subject of your note shall receive the attention of this government.

I have, &c.,

WM. M. EVARTS.

No. 4.

Mr. Evarts to Mr. Sherman.

DEPARTMENT OF STATE,
Washington, November 24, 1879.

SIR: I have the honor to transmit herewith for your information and consideration a copy of a note to this Department, dated the 8th ultimo, from Sir Edward Thornton, the British minister at this capital, in relation to certain regulations for the prevention of collisions at sea; together with a printed copy of the inclosure mentioned in the minister's note.

I have, &c.,

WM. M. EVARTS.

No. 5.

Letter of same tenor and date to the Secretary of the Navy.

No. 6.

Mr. Evarts to Mr. Thompson.

DEPARTMENT OF STATE,
Washington, February 20, 1880.

SIR: Referring to the letter of this Department of the 24th of November last, inclosing for your information and consideration a copy, received from the British minister at this capital, of the revised regulations for preventing collisions at sea, promulgated by an order in council, provisionally, to take effect September 1, 1880, I now have the honor to recall the subject to your attention, and to beg you to do me the favor of giving me your views in regard to it, at as early a day as you conveniently can, in order that timely notice may be given to the British authorities in relation to the action of this government.

I have, &c.,

WM. M. EVARTS.

No. 7.

Letter of same tenor and date to the Secretary of the Treasury.

No. 8.

Mr. Sherman to Mr. Evarts.

TREASURY DEPARTMENT, *February* 25, 1880.

SIR: I have the honor to acknowledge the receipt of your letter of the 20th instant, requesting an early expression of the views of this Department in regard to the revised regulations for the prevention of collisions at sea, published by the British Government, under date of August 14, 1879, and forwarded by you to this Department, with a copy of accompanying note from the British minister at this capital, on the 24th of November last.

In reply I have respectfully to state, that the subject has been submitted to several officers of this Department for report, and that you will be advised, at an early date, of the decision reached in the matter, with a view to the notification of the British minister as requested.

Very respectfully,

JOHN SHERMAN,
Secretary.

No. 9.

Mr. Thompson to Mr. Evarts.

NAVY DEPARTMENT,
Washington, March 3, 1880.

SIR: I have the honor to acknowledge the receipt of your letter of the 20th ultimo, referring to yours of the 24th of November last, and

requesting the views of this Department in regard to the revised regulations for preventing collisions at sea, received from the British minister at this capital.

On the 22d of January last, I addressed a communication to the Speaker of the House of Representatives, in answer to a resolution of the House, setting forth the views of the Department on this subject.

Accompanying that communication were a number of papers, copies of which are not now available. It is understood that it is the intention of the House of Representatives to have the communication and its accompaniments printed. As soon as I can obtain a copy I will forward it to you.

Very respectfully, &c.,

R. W. THOMPSON,
Secretary of the Navy.

No. 10.

Sir Edward Thornton to Mr. Evarts.

WASHINGTON, *April* 23, 1880.

SIR: In compliance with an instruction which I have received from the Marquis of Salisbury, I have the honor to inform you, with reference to previous correspondence respecting the adoption by the various maritime states of the international regulations for the prevention of collisions at sea, that, in consequence of representations on behalf of the various fishing interests of Great Britain, it has been decided by the president of the board of trade and the first lord of the admiralty to suspend the operation of article 10 of these regulations until the 1st of September, 1881.

I inclose copies of the Queen's order in council, which has been passed with the above object.

I have, &c.,

EDW'D THORNTON.

[Inclosure in Sir Edward Thornton's note of April 23, 1880.]

AT THE COURT AT WINDSOR, THE 24TH DAY OF MARCH, 1880.

Present, the Queen's Most Excellent Majesty in council.

Whereas by "The Merchant Shipping Act Amendment Act, 1862," it was enacted that on and after the first day of June, one thousand eight hundred and sixty-three, or such later day as might be fixed for the purpose by order in council, the regulations contained in the table marked C, in the schedule to the said act, should come into operation and be of the same force as if they were enacted in the body of the said act; but that Her Majesty might from time to time, on the joint recommendation of the admiralty and the board of trade, by order in council, annul or modify any of the said regulations, or make new regulations in addition to or in substitution therefor; and that any alterations in or additions to such regulations made in manner aforesaid should be of the same force as the regulations in said schedule;

And whereas, by the same act, it was further provided that whenever it should be made to appear to Her Majesty that the government of any foreign country was willing that the regulations for preventing collisions contained in table C, in the schedule to the said act, or such other regulations for preventing collisions as are for the time being in force under the said act, should apply to the ships of such country when beyond the limits of British jurisdiction, Her Majesty might, by order in council, di-

rect that such regulations should apply to the ships of the said foreign country, whether within British jurisdiction or not; and it was further provided by the said act that whenever an order in council had been issued applying any regulation made by or in pursuance of the said act to the ships of any foreign country, such ships should, in all cases arising in any British court, be deemed to be subject to such regulation, and should, for the purpose of such regulation, be treated as if they were British ships;

And whereas, by an order in council made in pursuance of the said recited act, and dated the ninth day of January, one thousand eight hundred and sixty-three, Her Majesty was pleased to direct that there should be substituted for the regulations contained in the schedule to the said act certain regulations appended to the said order, and that the said appended regulations should, on and after the first day of June, one thousand eight hundred and sixty-three, apply to French ships, whether within British jurisdiction or not;

And whereas, by several orders in council subsequently made, Her Majesty was pleased to direct that the regulations appended to the said recited order should apply to ships of the countries specified in the said orders, whether within British jurisdiction or not; and whereas, by order in council, dated the thirtieth day of July, one thousand eight hundred and sixty-eight, Her Majesty was pleased to make certain additions to the regulations appended to the said first recited order in council;

And whereas, by order in council, dated the fourteenth day of August, one thousand eight hundred and seventy-nine, Her Majesty, on the joint recommendation of the admiralty and the board of trade, was pleased to direct that on and after the first day of September, one thousand eight hundred and eighty, the said regulations and the additions thereto should be annulled, and that there should be substituted therefor the new regulations contained in the first schedule thereto, and that the same should, from and after the first day of September, one thousand eight hundred and eighty, apply to ships of the countries mentioned in the said second schedule thereto, whether within British jurisdiction or not;

And whereas article numbered nine of the regulations appended to the said recited order in council of the ninth day of January, one thousand eight hundred and sixty-three, is as follows, that is to say:

ART. 9. Open fishing boats and other open boats shall not be required to carry the side lights required for other vessels, but shall, if they do not carry such lights, carry a lantern having a green slide on the one side and a red slide on the other side, and on the approach of or to other vessels such lantern shall be exhibited in sufficient time to prevent collision so that the green light shall not be seen on the port side nor the red light on the starboard side.

Fishing vessels and open boats, when at anchor or attached to their nets and stationary, shall exhibit a bright white light.

Fishing vessels and open boats shall, however, not be prevented from using a flare-up in addition, if considered expedient.

And whereas the article numbered ten of the said new regulations, contained in the first schedule of the said recited order in council of the fourteenth day of August, one thousand eight hundred and seventy-nine, which said article is to be in substitution for the said recited article numbered nine, is as follows, that is to say:

ART. 10. (*a*) Open fishing boats and other open boats, when under way, shall not be obliged to carry the side lights required for other vessels, but every such boat shall in lieu thereof have ready at hand a lantern with a green glass on the one side and a red glass on the other side, and on the approach of or to other vessels, such lantern shall be exhibited, in sufficient time to prevent collision, so that the green light shall not be seen on the port side, nor the red light on the starboard side.

(*b*) A fishing vessel and an open boat when at anchor shall exhibit a bright white light.

(*c*) A fishing vessel, when employed in drift-net fishing, shall carry on one of her masts two red lights in a vertical line, one over the other, not less than three feet apart.

(*d*) A trawler at work shall carry on one of her masts two lights, in a vertical line, one over the other, not less than three feet apart; the upper light red, and the lower green; and shall also either carry the side lights required for other vessels, or, if the side lights cannot be carried, have ready at hand the colored lights, as provided in article 7, or a lantern with a red and green glass, as described in paragraph (*a*) of this article.

(*e*) Fishing vessels and open boats shall not be prevented from using a flare-up, in addition, if they desire to do so.

(*f*) The lights mentioned in this article are substituted for those mentioned in the twelfth, thirteenth, and fourteenth articles of the convention between France and England, scheduled to the British sea fisheries act, 1868.

(*g*) All lights required by this article, except side lights, shall be in globular lanterns, so constructed as to show all round the horizon.

And whereas the admiralty and the board of trade have jointly recommended to Her Majesty that the operation of the said recited article numbered ten of the new

regulations contained in the first schedule of the said order in council of the fourteenth day of August, one thousand eight hundred and seventy-nine, shall be suspended until the first day of September, one thousand eight hundred and eighty-one, and that, in lieu thereof and in substitution therefor, the recited article numbered nine, of the regulations appended to the said order in council of the ninth day of January, one thousand eight hundred and sixty-three, shall continue and remain in force until the said first day of September, one thousand eight hundred and eighty-one:

Now, therefore, Her Majesty, by virtue of the powers vested in her by the said recited act, and by and with the advice of her privy council, is pleased to direct that the operation of the said recited article numbered ten of the new regulations contained in the first schedule of the said order in council of the fourteenth day of August, one thousand eight hundred and seventy-nine, shall be suspended until the first day of September, one thousand eight hundred and eighty-one, and that, in lieu thereof and in substitution therefor, the said recited article numbered nine, of the regulations appended to the said order in council of the ninth day of January, one thousand eight hundred and sixty-three, shall continue and remain in force until the said first day of September, one thousand eight hundred and eighty-one.

C. L. PEEL.

No. 11.

Mr. Evarts to Mr. Thompson.

DEPARTMENT OF STATE,
Washington, April 26, 1880.

SIR: I have the honor to transmit herewith, for your information and consideration, a copy of an order in council, dated the 24th ultimo, suspending, until September 1, 1881, the operation of article 10 of the regulations established by Her Majesty's Government for preventing collisions at sea, the order in question having been communicated to this Department by Sir Edward Thornton, the British minister at this capital, in a note dated the 23d instant.

I have, &c.,

WM. M. EVARTS.

No. 12.

Letter of same tenor and date to the Secretary of the Treasury.

No. 13.

Mr. Evarts to Sir Edward Thornton.

DEPARTMENT OF STATE,
Washington, April 27, 1880.

SIR: I have the honor to acknowledge the receipt of your note of the 23d instant, referring to previous correspondence relative to the adoption of international regulations for the prevention of collisions at sea, and transmitting copies of an order in council suspending the operation of article 10 of the regulations in question, until 1st of September, 1881. With thanks for the accompaniments of your note, I beg to in-

form you, in reply, that I have furnished my colleagues of the Navy and Treasury Departments with copies of the same for their information and consideration.

I have, &c.,

WM. M. EVARTS.

No. 14.

Mr. Thompson to Mr. Evarts.

NAVY DEPARTMENT,
Washington, May 10, 1880.

SIR: Referring to my letter of the 3d of March last, I now have the honor to transmit a printed copy of "Executive Document No. 55, Forty-sixth Congress, second session," in relation to rules for the guidance of naval vessels at sea.

I am, &c.,

R. W. THOMPSON,
Secretary of the Navy.

House Ex. Doc. No. 55, 46th Congress, 2d session.

RULES FOR NAVAL VESSELS.

Letter from the Secretary of the Navy, transmitting, in response to a resolution of the House of Representatives, rules for the guidance of naval vessels at sea.

JANUARY 27, 1880.—Referred to the Committee on Naval Affairs.

MARCH 10, 1880.—Recommitted to the Committee on Naval Affairs and ordered to be printed, to accompany bill H. R. 4430.

NAVY DEPARTMENT,
Washington, January 22, 1880.

SIR: I have the honor to acknowledge the receipt of the resolution of the House of Representatives, passed on the 9th instant, which requires the Secretary of the Navy to report to the House "the rules prescribed by the Navy Department for the guidance of naval vessels at sea; whether, in his opinion, the same are in conflict with the existing rules for the guidance of merchant vessels; and, if so, wherein such a conflict exists; and also what measures are, in his opinion, necessary to be taken to establish a system of international rules which shall apply to all naval and merchant vessels at sea," and in compliance therewith to submit the following report:

Although certain principles with regard to the conduct of vessels meeting and passing each other at sea, common to all maritime nations, may be traced back almost as far as marine commerce itself, the attempts to embody these principles into rules for national or universal observance is of comparatively recent origin.

As far as the *naval* vessels of a country are concerned, these principles are found embodied in regulations which are centuries old, and which form elements of the science of naval tactics. These regulations, however, in former times had little, if any, legal control over vessels of the merchant marines.

As commerce increased in extent and importance, and as the control of vessels of the merchant marines passed from the hands of owners to those of local boards of trade, and from those of local to those of national boards, we find different nations introducing these rules as statutes for general observance; and as the science of maritime law became developed and the absolute freedom of the high seas came to be acknowledged by all maritime nations, the necessity for some universal law for the guidance of vessels on the ocean became apparent.

The first movement towards establishing some universal law seems to have been made about the year 1842; the Government of Great Britain taking the initiative. In this year the British admiralty issued a set of orders prescribing certain lights to be used at night by *all* British vessels; the same order made a steering rule applicable to

all British vessels that had previously been a board of trade rule only, and which was generally known as the "law of the port helm." (See Appendix G.) These rules were not formally submitted to other nations, but before 1844 the majority of the maritime nations of the world had adopted them either in whole or in part. In the United States they were adopted by the Navy Department only, appearing verbatim in a general order to all the United States vessels.

The law of the port helm was, however, very faulty, and in 1852 the British admiralty issued instructions, under the authority of an act of Parliament, to a committee, composed of officers of the royal navy and an Elder Brother of the Trinity House, to examine and report upon them.

In consequence of the condemnatory report of this committee, a second committee was organized by act of Parliament, composed of officers of the royal navy, Elder Brethren of the Trinity House, and members of the board of trade, to frame laws for preventing collision at sea. These laws were submitted to Parliament in 1862. They were made statutory in Great Britain, and all other maritime nations were invited to examine them in the interests of commerce at large, and, if found suitable, to legalize them.

In the course of the next two years thirty-four of the principal maritime nations of the world had approved and made statutory these laws.

In 1877, it having been found that these laws did not fulfill the requirements of marine commerce, an act of Parliament was passed authorizing an examination of them by a board similar to the previous one, consisting of naval officers, Trinity House Brethren, and members of the board of trade. By this committee a revised set of laws was compiled and submitted to the government. The British Government submitted them to all the foreign maritime powers, and after sixteen of these powers had signified their approval of them and their intention to legalize them for national usage, the British Parliament made them statutory to go into effect on the 1st of September, 1880.

It is thus seen that the present international rules for preventing collision are due entirely to the action of the British Government, and before entering into a discussion of the actions of our own government, it is necessary to examine more closely the methods by which Great Britain arrived at the desired result.

Every nation has a right to make such *municipal* laws as it sees fit; therefore the right of the British Government to force the use of certain lights on board its naval and merchant vessels is unquestionable.

The British admiralty (corresponding to the United States Navy Department) issued the first instructions binding upon *all* British vessels, and upon reference to British authority it is found that previous to, and for some time after 1842, the admiralty had a certain control over the merchant marine, which included matters of this general description.

It will be noticed that the first revisory board was made up of naval officers and a Trinity House Brother.

Referring again to authority we find that between 1842 and 1850 all pilot regulations were placed under the control of the Trinity House, and these light and steering rules were considered to come within the limits of pilot law. Therefore the controlling departments of the navy and the merchant marine were both represented on the committee.

In 1862 we see the new rules framed by a committee of naval officers, Trinity Brethren, and members of the board of trade. Again by reference we find that in 1854 the British merchant marine was placed under the directions of the board of trade, the pilots remaining under the Trinity House. Thus, again, the whole marine was represented.

The new rules having been made statutory were submitted for approval to foreign governments, and it was stated that all foreign ships who were guided by these rules should be treated as British ships in British courts of law. All the principal nations of the world approved and legalized these laws, and immediately the laws or rules *changed their character*. From being municipal laws, as enacted by Great Britain alone, they became, by the force of the common consent of commercial nations, an integral part of the law of the sea. It is not out of place to quote here an extract from an opinion on this self-same subject delivered by Mr. Justice Strong in the Supreme Court of the United States (14 Wall., 188).

"When we find such rules of navigation accepted as obligatory rules by more than thirty of the principal commercial states of the world, including almost all which have any shipping on the Atlantic Ocean, we are constrained to regard them as in part, at least, and so far as relates to these vessels, the laws of the sea. Undoubtedly no single nation can change the law of the sea. The law is of universal obligation, and no statute of one or two nations can create obligations for the world. Like the laws of nations it rests upon the common consent of civilized communities."

It is stated that in 1877 the British Parliament authorized an examination of these laws, and the result of this examination was the compilation of a revised set of laws

which have been made statutory in Great Britain. Let us examine the mode of procedure in the light of the Supreme Court decision above quoted.

The proclamation declaring these revised rules statutory tells the whole story, and the following extracts are sufficient:

"And whereas the admiralty and board of trade have jointly recommended to Her Majesty that the regulations contained in the order in council * * * shall be annulled, and that there shall be substituted * * * the new regulations; and, whereas, it has been made to appear to Her Majesty that the governments of the several foreign countries mentioned * * * are respectively willing that the regulations * * * shall apply to ships of the said countries respectively, whether within British jurisdiction or not; now, therefore. * * * "

Here we see a distinct acknowledgment of the necessity of consulting foreign nations before changing the rules which Great Britain itself had made. This proclamation declaring the new rules statutory was not made until the approval of sixteen of the principal commercial nations of the world had been obtained. Nothing could be more plainly implied. The rules of 1862 were first made statutory, and then submitted to foreign governments. Their successors were first submitted to foreign governments, and *after their approval had been obtained*, they were made statutory.

I now turn to the consideration of the actions of the United States Government with regard to rules for preventing collisions.

In 1838, Congress enacted a statute making it obligatory for all *steamers* to carry one or more signal lights at night. In 1842 the United States Navy Department adopted for the guidance of naval vessels the British steering and light rules which had been enacted that year. In 1849, Congress enacted a statute obliging all merchant vessels navigating the Northern and Western lakes to carry the lights prescribed by the Navy Department order above mentioned.

In 1852 Congress authorized the appointment of nine supervising inspectors, amongst whose duties it was specified—

"That it shall be the duty of the supervising inspectors to establish such rules and regulations, to be observed by all such vessels (steamers navigating rivers only), in passing each other, as they shall from time to time deem necessary for safety."

In 1863 Congress enacted a law establishing "regulations for preventing collisions on the water," which regulations were in conformity with those submitted by the British Government for its approval. In that same year these regulations were established in conformity with the act of Congress as the guiding rules for naval vessels by General Order No. 34, issued by the Secretary of the Navy, which order has never been annulled or modified.

In 1865 the statutes with regard to supervising inspectors were so amended as to empower them to make steering and light regulations for all American vessels.

In 1874 the United States Statutes at Large were revised and compiled under the title of "The Revised Statutes of the United States." In this compilation the regulations for preventing collisions were amended and appeared as section 4233.

In 1878 the British Government submitted for the approval of the United States a set of amended regulations for preventing collisions at sea. These regulations were approved by the Treasury Department for the United States Government, and the British Government was notified of this approval, and partially in consequence of this approval the British Government made them statutory.

In 1879 a bill was submitted to the consideration of the Committee on Commerce of Congress proposing certain amendments to section 4233 of the Revised Statutes. This bill is still under the consideration of the committees.

These having been the actions of the United States Government, it remains to examine the effects produced by them. Previous to the year 1863, all these actions were strictly within the province of municipal law. In that year Great Britian submitted her rules with the avowed intention of attempting to establish an international maritime law. (See appendix B.) These rules were approved by the Navy Department for the government, and in accordance with its suggestions, the rules, so amended as to extend their force to United States inland waters, were made statutory. In suggesting these amendments directly to Congress, the examining officers encroached upon the specific duties of the supervising inspectors, who, as shown above, made regulations for inland waters. They furthermore failed to comprehend the strictly international signification of the rules in recommending them for inland waters, although it was plainly evident that in certain places local regulations might be necessary which would interfere, if not conflict, with the rules for the sea. This point was even made by the British Government in subsequent correspondence. (See appendix F.) No notice, however, was taken of it, and the British Government, in a circular shortly afterward issued to all governments, naming those powers who had approved the regulations, mentions the United States in the list, as follows:

"United States sea-going ships.

"United States inland waters."

Our government being the only one in which inland waters are mentioned. In 1865

the Board of Supervising Inspectors, in conformity with the powers delegated to it by Congress, made certain pilot rules for lake and seaboard, and "pilot rules for Western rivers." The necessity for these rules is unquestionable, and in framing them it was necessary to depart in many particulars from the precepts of the general rules which had become international. The making of such rules did not imply any violation of the international rules, but no information of their enactment was given to foreign countries. Thus an act of discourtesy to all nations was done by the United States in leaving them to believe that the general rules applied still to our inland waters. Although naval vessels are constantly patrolling our lakes, seaboard, and Western rivers, no notification of the enactment of these rules appears to have ever been given to the Navy Department. This notification was a matter of prime necessity, as since naval vessels are by statute exempted from the control of such municipal laws, the Navy Department should have been notified in order that proper and conforming regulations could be issued for its guidance.

In 1874 the regulations were inserted as section 4233 of the Revised Statutes, the wording having been amended. As long as the intent of the international rules remained unchanged and intact, the right to amend the wording was indisputable. But whatever *power* the government may possess, it had not the *right* to in any way impair the signification of the international rules (vide Supreme Court opinion above quoted). The wording of section 4233 is changed in many places. Omitting all changes that do not modify the intent, attention is called to the following points. In the second clause of the first article or rule the following difference of reading occurs:

International rule: "And every steamship which is under steam, whether under sail or not, is to be considered a *ship under steam*."

Statute rule: "And every steam-vessel, which is under steam, whether under sail or not, shall be considered a *steam-vessel*."

By this change, it is claimed that the sense of the law is mutilated if not perverted; for, by referring to the opening words of rules 18 and 19 we find, "If two vessels under steam are * * * ." The question arises, what constitutes a vessel under steam? This point is specifically answered in the international rule. It is not even referred to in the statute, and by the latter the claim may be set up that a vessel under *steam* and *sail* is not to be considered a vessel under steam. To landsmen this may appear a quibble, but it is by no means the case. A steam-vessel, having the wind in her favor, may set all her sails and use only so much of her steam power as will overcome the resistance of the propeller to the water, in order to economize fuel. In this condition she is under steam and sail, but her steam power is not sufficient to control her movements. This is a condition in which naval vessels of all nations are very commonly placed, and merchant-vessels frequently; and it is seen at a glance that in case of collision this question would certainly arise, and could only be decided by referring to the intent of the statute as expressed in the original rule.

It is objected to the statutory reading that it is in no sense a definition, as it reduces itself to defining a steam-vessel as being a steam-vessel when under steam.

Article 20 of the international rules reads as follows:

"Nothing in these rules shall exonerate any ship, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout or of the neglect of any precaution which may be required by the ordinary practice of seamen or by the special circumstances of the case."

This article is of such importance that its precepts are found repeatedly quoted in admiralty opinions, yet it is entirely omitted from the statutes.

Rule 14 of the Revised Statutes reads as follows:

"The exhibition of any light on board of a vessel of war of the United States may be suspended whenever in the opinion of the Secretary of the Navy the commander in chief of a squadron, or the commander of a vessel acting singly, the special circumstances of the service may require it."

This is a complete precept affecting all the international light rules, but it is neither expressed nor implied in the original rules, nor does it appear in the latest authorized Regulations of the Navy, although of application to naval vessels only. More than this, the rule itself is in direct violation of the principles of international law.

No matter what rights naval vessels may claim during war time within the jurisdiction of the United States, they cannot jeopardize neutral life and property on the high seas. A defense founded on this rule in any foreign court or in courts of arbitration would not stand an instant.

The rules being originally intended to form an integral part of international maritime law, and as such having received the approval of the United States in common with the rest of the commercial world, it became not only a point of national honor, but one of necessity, in order to guard them against mischievous legislation, that they should of themselves form a single section of the statutes, from which all strictly municipal regulations should have been carefully excluded.

By reference to section 4233, it will be found that Rules VI, VII, and XII, are regulations neither mentioned nor contemplated in the original rules. They are now and

by their nature must always be municipal regulations, and however absolute the necessity for their existence may be, they are out of place in the midst of international rules. The rules for preventing collisions having become *de facto* an integral part of international maritime law before the Revised Statutes were compiled, the above-mentioned examples clearly show that in approving section 4233 the United States Government did violence to the laws of the sea.

It has been stated that in 1878 the British Government submitted revised rules for the approval of the United States, and that the approval was given by the Treasury Department for the government. In so far as the merchant marine was concerned, this approval was perfectly regular, *provided* that such approval originated with the Board of Supervising Inspectors, in whom lies the power delegated by Congress to make regulations of this nature for the merchant marine.

That the approval did so originate is doubted.

There was no authority, however, for the Treasury Department to examine and approve these rules for the Navy. That an examination by the Navy Department was necessary is plainly evident from the fact that one of the new rules affects naval vessels especially. Leaving this special case, however, out of consideration, the fact remains that we have squadrons of naval vessels constantly cruising on the high seas and in foreign waters, which must be guided by the law of the sea; therefore the controlling authority of these vessels should certainly be consulted with regard to amendments in the law which affects these vessels. Our manner of legislation upon this subject being thus proved faulty and injurious, the questions arise, To whom is the fault attributable? And how may it be remedied? The responsibility lies directly with Congress, but in a matter of this kind Congress alone is not competent to judge of the technicalities, and must call to its assistance authorities on marine affairs. The fault originally must be placed at the doors of the Navy Department, whose officers, in 1863, having in their possession a knowledge of the methods adopted by Great Britain in framing the rules, approved of them arbitrarily for both the Navy and merchant marine. Had it not been during a time of war, when our sea-going commerce was almost totally destroyed, and when all such matters were naturally referred to the Navy Department, this general approval would not have escaped protest by the Treasury Department, and proper means for approving the rules would have been used.

Since amended rules have now been approved and legislated upon by fifteen of the principal maritime nations of the world, the present seems to be the proper time to remedy former faults and to aid instead of obstruct the development of international law.

In seeking the remedy it is not out of place to refer to the actions of the British Parliament under similar circumstances. We find that invariably when it became necessary to legislate upon collision rules committees were formed as parliamentary advisers, in which the whole British marine was represented. First it was the British admiralty alone; then the admiralty and Trinity House; then the admiralty, the Trinity House, and the board of trade; and finally, when the rules become international, the marine authorities of the entire commercial world.

In the United States we have no national board of trade or national pilot control.

The Board of Supervising Inspectors, in a manner, possess the authority in regard to steering and light rules that is vested in Great Britain in the board of trade and Trinity House. It would seem that in appointing an advisory board, to properly examine the amended rules, a difficulty would arise in providing a fair and competent representation for the merchant marine, for the reason that although the power to make regulations with regard to lights and pilotage is vested in the Board of Supervising Inspectors, the members of that board are not necessarily experts in general maritime affairs. The special function of the members of this board is the examination of marine boilers; and although the general control of pilotage matters is in their hands, the more immediate practical control is vested in local pilot commissioners.

The approval of the new rules by the Treasury Department having been improper, I would respectfully suggest that a re-examination of them be ordered by Congress, to be made by a committee representing the whole marine. A committee composed of the following members would, I think, meet the requirements:

Two naval officers: To represent the Navy.

Two supervising inspectors: To represent the merchant marine.

One revenue officer: To represent the revenue marine and act as adviser to the inspectors.

One pilot commissioner: Chosen from among the pilot commissioners of one of our large seaports, to represent pilot interests, and act as adviser to the inspectors.

One naval officer: To represent the interests of international maritime law exclusively.

In this manner there would be three members chosen directly from the Navy Department, three from the Treasury Department, and one from a local control; all

branches of marine interest would be properly represented, and matters of international import would be properly guarded.

I respectfully call attention to the fact that the United States Government is already committed to an approval of the new rules, and, as they have at this time become a part of international law, the government is bound to act in accordance with all the precepts therein stated. The functions of the examining board would be confined to making such amendments of the wording as may seem proper and necessary. They are at liberty to enlarge the precepts but not to curtail them.

I respectfully recommend that whatever rules be approved by this committee should be approved by the Navy and Treasury Departments before being submitted to Congress, and, after being made statutory, they should be brought to the notice of all foreign maritime nations who have already approved the amended British rules.

Very respectfully,

R. W. THOMPSON,
Secretary of the Navy.

Hon. SAMUEL J. RANDALL,
Speaker of the House of Representatives.

[Inclosures accompanying communication of Secretary of the Navy, January 22, 1880.]

A.

Letter from Secretary of State to Secretary of the Navy.

DEPARTMENT OF STATE,
Washington, January 13, 1863.

SIR: I have the honor to invite your attention to the inclosed copy of a communication of the 10th instant from Lord Lyons, relative to regulations for preventing collisions at sea, and will thank you to cause them to be examined by an intelligent officer or officers, and the result communicated to this Department. A similar communication has also been received at this Department from the French legation.

I am, sir, &c.,

W. H. SEWARD.

Hon. GIDEON WELLES,
Secretary of the Navy.

B.

Letter from Lord Lyons to the Secretary of State.

WASHINGTON, *January* 10, 1863.

SIR: I have received the orders of my government to address to you the following communication:

The great increase which has lately taken place in the number of ships employed upon the ocean, the changes which are being made in the build and character of those ships, and more especially the introduction and rapid extension of steam navigation, have for some time made it necessary to alter and amend the rules and practice formerly observed for the purpose of preventing collisions at sea. Certain improvements have consequently been made from time to time, both in the description of lights and signals to be used by vessels at night, and also in the rules to be observed by vessels when approaching one another. Some of these alterations, those, for example, which relate to green and red side lights, have already been adopted by most maritime nations, but even in these cases the adoption of the new system by each nation has hitherto only had the effect of a municipal law, whilst in other cases the rules and practice adopted by different nations are inconsistent and conflicting. That the law and practice of all the maritime nations of the world concerning the precautions to be observed for preventing collisions at sea should be adapted to the exigencies of modern navigation; that they should be consistent and uniform, without distinction of flag or of place; and that they should have the force of international maritime law, are objects the importance of which it is unnecessary to urge. Under these circumstances the Governments of Great Britain and France have prepared a set of rules which will, they believe, if adopted by the maritime nations of the world, fulfill the objects above

mentioned. The rules are to come into force on the 1st day of June, 1863. They will from that date govern British and French ships, and will be capable of being inforced with regard to such ships in the courts of either country. To complete the work thus begun, it is necessary to procure the concurrence of other nations; and for this purpose I am charged by Her Majesty's Government to communicate to you the inclosed copy of the above-mentioned rules, and to express the hope that the Government of the United States may see fit to apply them to its own ships, and to signify to Her Majesty's Government its desire that such ships may in any questions that may arise in British courts of law be treated accordingly. Her Majesty's Government are the more ready to believe that this course will be willingly acceded to, since the rules in question have been so framed as to adhere as closely as the wants of modern navigation will permit to the established practice of the sea. I have only to add that a communication similar to the present will be addressed on the part of the British and French Governments to the governments of every maritime nation, in the hope that the rules in question may thus be universally adopted, and that they may become an integral part of the international law of the world.

I have the honor, &c.,

LYONS.

Hon. WM. H. SEWARD,
Secretary of State.

[Indorsements written on the back of the above letter.]

C.

I have examined these rules and approve them as a general system. But in time of war, belligerents would or would not adopt them at discretion, according to circumstances. They should apply to vessels on our western waters in whole or at least in part.

JOSEPH SMITH,
Rear-Admiral.

I have examined the within rules carefully, and in my judgment their adoption and enforcement by ourselves would tend materially to lessen chances of collision by our vessels. They are well drawn and certainly well calculated to subserve the purposes for which they are intended.

L. M. GOLDSBOROUGH,
Rear-Admiral, United States Navy.

I concur in the above.

C. H. DAVIS,
Commodore, United States Navy.

These rules are very nearly those which now govern the usage of the sea service, but they only apply to sea-going steamers. I think they should be alike applicable, and receive the force of law, to all steamers and vessels upon our inland waters also. So far as naval vessels are concerned, there are times when the commander must have the authority to suspend these rules entirely.

G. V. FOX,
Assistant Secretary.

D.

Letter from Secretary Welles to Secretary Seward.

NAVY DEPARTMENT, *January* 21, 1863.

SIR: Your letter of the 13th instant, inclosing the communication of Lord Lyons dated the 10th instant, addressed to yourself and containing the "regulations for preventing collisions at sea," to be adopted by the English and French Governments on the 1st day of June, 1863, has been received and carefully examined. These regulations are approved by the Department, and from the 1st of June next will be adopted for the naval service subject to temporary suspension or alternation by any naval commander according to the circumstances or exigencies under which they may be placed. I respectfully suggest that article 3d should be altered so as to read thus: "All steam-

vessels when under way shall carry," and that "regulations for preventing collisions at sea," be altered so as to read "regulations for preventing collisions on the water." The object of these changes is to have one uniform rule on the water instead of confining the great usefulness of the regulations to the sea alone. For example, the great lakes and river St. Lawrence, as well as the waters near our northwestern boundaries are used by ourselves and the vessels of the British in common, and it would seem desirable that invariable rules should govern the vessels of both nations. If the same necessity exists for harmony in the inland waters of Europe and Asia it is a proper occasion to urge rules which shall be universal. The Department will present these regulations, altered as above suggested, and ask Congress to adopt them for all classes of vessels, including those upon the inland waters of the United States as well as at sea.

I am, &c.,

GIDEON WELLES,
Secretary.

Hon. WM. H. SEWARD,
Secretary of State.

E.

Letter from Secretary Welles to the Committee on Commerce.

NAVY DEPARTMENT, *January* 23, 1863.

SIR: I have the honor to transmit herewith a copy of "Regulations for preventing collisions on the water." These regulations have been adopted by the great maritime nations of England and France, who have brought them to the attention of this government and asked its adoption of them. They will be put in force so far as those two nations are concerned on and after the 1st of June, 1863. The Department has examined them carefully, and they meet with its approval. It proposes to adopt them in the naval service, and desires that Congress may give them legal force. It is equally important that a uniform system should prevail in the mercantile as well as in the naval service, and the Department therefore deems it proper to bring the subject to the attention of the Committee on Commerce, and to suggest such action by Congress as will accomplish this object. I have taken the liberty of inclosing a draught of an act which would seem to cover the case. It is the intention of the British and French Governments to invite the attention of every maritime nation to these regulations, in the hope that they may be universally adopted, and become an integral part of the international law of the world. Copies of the letter of the Secretary of State and of the communication addressed to him by Lord Lyons, with which the regulations were transmitted to this Department, are herewith inclosed.

Respectfully, &c.,

GIDEON WELLES,
Secretary.

Hon. E. B. WASHBURNE,
Chairman Committee on Commerce,
House of Representatives.

F.

Letter from Lord Lyons to Secretary of State.

WASHINGTON, *May* 1, 1863.

SIR: Her Majesty's Government have learned with much satisfaction from the note which you did me the honor to address to me on the 22d January last, that the Government of the United States approved the regulations for preventing collisions at sea which have been concerted between the Governments of Great Britain and France. With regard to the suggestion of the United States Secretary of the Navy, that the wording of the regulations should be modified so as to make them applicable to steam-vessels on lakes and rivers as well as to those on the sea, Her Majesty's Government find that it is not in their power to make the regulations applicable to all inland navigation, as there are rivers in the United Kingdom and probably in other parts of Europe in which special local regulations exist with which it would not be proper to interfere. The principal object which the Secretary of the Navy had in view would, however, be attained if the operation of the regulations should be extended to the

inland lakes of North America and to the waters of the river St. Lawrence, and Her Majesty's Government have accordingly entered into communication with the Provincial Government of Canada for the purpose of ascertaining whether such an extension would be feasible.

I have the honor, &c.,

LYONS.

Hon. WM. H. SEWARD,
Secretary of State.

G.

The law of port helm.

The lords commissioners of the admiralty are furthermore pleased to direct that the recognized Trinity House rules, that all vessels should keep their course, are to be acted upon except where there is danger of collision, and in that case each vessel should invariably put her helm aport.

REGULATIONS FOR PREVENTING COLLISIONS ON THE WATER.

[General Order No. 34.]

NAVY DEPARTMENT, *May* 4, 1864.

The provisions of the following act "fixing certain rules and regulations for preventing collisions on the water," to take effect on the 1st day of September, 1864, are adopted for the naval service of the United States from this date. As most of the collisions occur from the non-observance of article sixteen, it is particularly enjoined upon commmanding officers, in approaching another vessel, to slacken and stop in time to prevent the possibility of collision.

AN ACT fixing certain rules and regulations for preventing collisions on the water.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That from and after September one, eighteen hundred and sixty-four, the following rules and regulations for preventing collisions on the water be adopted in the Navy and the mercantile marine of the United States: *Provided*, That the exhibition of any light on board of a vessel of war of the United States may be suspended whenever, in the opinion of the Secretary of the Navy, the commander-in-chief of a squadron, or the commander of a vessel acting singly, the special character of the service may require it.

REGULATIONS FOR PREVENTING COLLISIONS (ON THE WATER AT SEA).

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10. Fog-signals.

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PRELIMINARY.

ART. 1. In the following rules, every steamship which is under sail, and not under steam, is to be considered a sailing ship; and every steamship which is under steam, whether under sail or not, is to be considered a ship under steam.

RULES CONCERNING LIGHTS.

LIGHTS.

ART. 2. The lights mentioned in the following articles, and no others, shall be carried in all weathers between sunset and sunrise.

LIGHTS FOR STEAMSHIPS.

ART. 3. All steam-vessels (sea-going steamships), when under way shall carry—

(*a*) At the foremast-head, a bright white light, so fixed as to show a uniform and unbroken light over an arc of the horizon of twenty points of the compass, so fixed as to throw the light ten points on each side of the ship, viz, from right ahead to two points abaft the beam on either side, and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least five miles.

(*b*) On the starboard side, a green light, so constructed as to show a uniform and unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side, and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(*c*) On the port side, a red light, so constructed as to show a uniform unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the port side, and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(*d*) The said green and red side lights shall be fitted with inboard screens, projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

LIGHTS FROM STEAM-TUGS.

ART. 4. Steamships, when towing other ships, shall carry two bright white mast-head lights vertically, in addition to their side lights, so as to distinguish them from other steamships. Each of these mast-head lights shall be of the same construction and character as the mast-head lights which other steamships are required to carry.

LIGHTS FOR SAILING-SHIPS.

ART. 5. Sailing-ships under way, or being towed, shall carry the same lights as steamships under way, with the exception of the white mast-head lights, which they shall never carry.

EXCEPTIONAL LIGHTS FOR SMALL SAILING-VESSELS.

ART. 6. Whenever, as in the case of small vessels during bad weather, the green and red lights cannot be fixed, those lights shall be kept on deck, on the respective sides of the vessel, ready for instant exhibition, and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side, nor the red light on the starboard side.

To make the use of these portable lights more certain and easy, they shall each be painted outside with the color of the light they respectfully contain, and shall be provided with suitable screens.

LIGHTS FOR SHIPS AT ANCHOR.

ART. 7. Ships, whether steamships or sailing-ships, when at anchor in roadsteads or fairways, shall, between sunset and sunrise, exhibit where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light in a globular lantern of eight inches in diameter, and so constructed as to show a clear, uniform, and unbroken light visible all around the horizon, and at a distance of at least one mile.

LIGHTS FOR PILOT-VESSELS.

ART. 8. Sailing pilot-vessels shall not carry the lights required for other sailing vessels, but shall carry a white light at the mast-head, visible all around the horizon, and shall also exhibit a flare-up light every fifteen minutes.

LIGHTS FOR FISHING VESSELS AND BOATS.

ART. 9. Open fishing-boats and other open boats shall not be required to carry sidelights required for other vessels; but shall, if they do not carry such lights, carry a lantern having a green slide on the one side and a red slide on the other side, and on the approach of or to other vessels, such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side, nor the red light on the starboard side. Fishing-vessels and open boats when at anchor, or attached to their nets and stationary, shall exhibit a bright white light. Fishing-vessels and open boats shall, however, not be prevented from using a flare-up in addition, if considered expedient.

RULES GOVERNING FOG SIGNALS.

FOG SIGNALS.

ART. 10. Whenever there is a fog, whether by day or night, the fog-signals described below shall be carried and used, and shall be sounded at least every five minutes, viz:

(*a*) Steamships under way shall use a steam-whistle, placed before the funnel, not less than eight feet from the deck.

(*b*) Sailing-ships under way shall use a fog-horn.

(*c*) Steamships and sailing-ships, when not under way, shall use a bell.

STEERING AND SAILING RULES.

TWO SAILING-SHIPS MEETING.

ART. 11. If two sailing-ships are meeting end on, or nearly end on, so as to involve risk of collision, the helms of both shall be put to port, so that each may pass on the port side of the other.

TWO SAILING-SHIPS CROSSING.

ART. 12. When two sailing-ships are crossing so as to involve risk of collision, then, if they have the wind on different sides, the ship with the wind on the port side shall keep out of the way of the ship with the wind on the starboard side, except in the case in which the ship with the wind on the port side is close-hauled, and the other ship free, in which case the latter ship shall keep out of the way. But if they have the wind on the same side, or if one of them has the wind aft, the ship which is to windward shall keep out of the way of the ship which is to leeward.

TWO SHIPS UNDER STEAM MEETING.

ART. 13. If two ships under steam are meeting end on, or nearly end on, so as to involve risk of collision, the helms of both shall be put to port, so that each may pass on the port side of the other.

TWO SHIPS UNDER STEAM CROSSING.

ART. 14. If the two ships under steam are crossing, so as to involve risk of collision, the ship which has the other on her own starboard side shall keep out of the way of the other.

SAILING-SHIP AND SHIP UNDER STEAM.

ART. 15. If the two ships, one of which is a sailing-ship, and the other a steamship, are proceeding in such directions as to involve risk of collision, the steamship shall keep out of the way of the sailing-ship.

SHIPS UNDER STEAM TO SLACKEN SPEED.

ART. 16. Every steamship when approaching another ship so as to involve risk of collision, shall slacken her speed, or, if necessary, stop and reverse; and every steamship shall, when in a fog, go at a moderate speed.

VESSELS OVERTAKING OTHER VESSELS.

ART. 17. Every vessel overtaking any other vessel shall keep out of the way of the said last-mentioned vessel.

CONSTRUCTION OF ARTICLES 12, 14, 15, AND 17.

ART. 18. Where, by the above rules, one of two ships is to keep out of the way, the other shall keep her course, subject to the qualifications contained in the following article:

PROVISO TO SAVE SPECIAL CASES.

ART. 19. In obeying and construing these rules due regard must be had to all dangers of navigation, and due regard must also be had to any special circumstances which may exist in any particular case rendering a departure from the above rules necessary in order to avoid immediate danger.

NO SHIP UNDER ANY CIRCUMSTANCES TO NEGLECT PROPER PRECAUTIONS.

ART. 20. Nothing in these rules shall exonerate any ship, or the owner or master, or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

Approved April 29, 1864.

Should a collision unfortunately take place, each commanding officer is required to furnish the department with the following information:

1st. His own report, that of the pilot, the officer of the deck, and other officers who witnessed the occurrence. These reports and statements are to be exemplified by a diagram, and must contain the courses steered, the point at which the vessel was first seen, the bearing, the time when the engine was slowed, when the vessel was stopped, whether in motion, and, if so, at what speed at the moment of collision, the direction of the wind, the condition of the weather and atmosphere, what lookouts were placed, what lights were exhibited by both vessels, whether either vessel deviated from the above rules and regulations, whether any blame can attach to any one, and, if so, to whom, and any and all other facts bearing upon the subject.

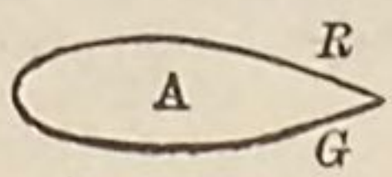
2d. Written statements and estimate of damage from officers of the vessel with which the vessel of the United States Navy collided, if they can be obtained.

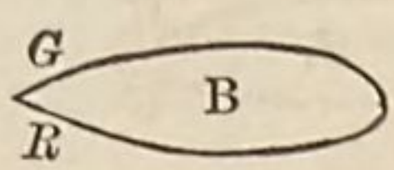
3d. Survey of the injury to both vessels by United States officers.

4th. If the vessel is in charge of a pilot, and the collision has occurred from his acting in violation of the above rules and regulations, the fact must be established in the report, and no pilotage paid to him.

The following diagrams are designed to illustrate the use of the lights carried by vessels at sea as prescribed in the foregoing order, and the manner in which they indicate to each vessel the position and course of the other.

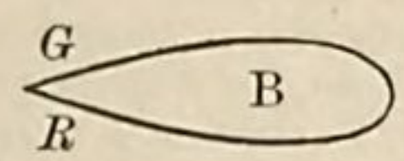
1. FIRST. When the *Red* and *Green lights* are both seen.—A sees a *red* and *green* light ahead; A knows that a vessel is approaching him on a course directly opposite to the one he is steering, as B:

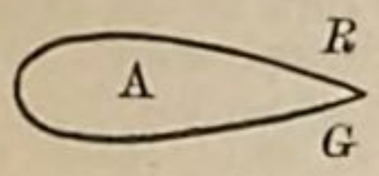




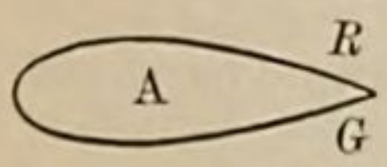
2. If A sees a *White mast-head light* above the *Red* and *Green lights*, he knows that the vessel B is a steamer. A should put his helm to port, and B, seeing the same lights, on board of A, should, by the same rule, put his helm to port also.

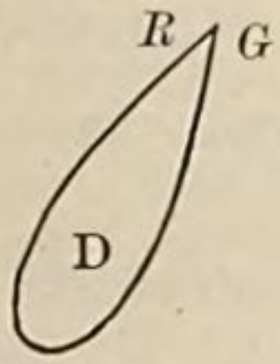
3. SECOND. When the *Red light* only is seen.—A sees a *Red light* ahead, or on the port bow; A knows that either, first, a vessel is approaching him on his port bow, as B,

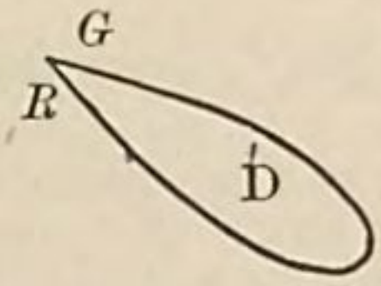


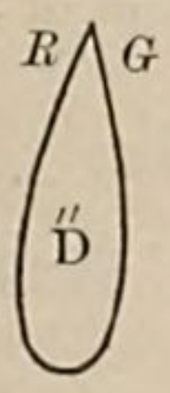


or, second, a vessel is crossing his bows to port in some direction, as D D′ D″.







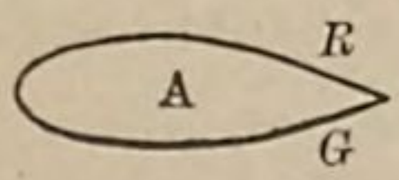


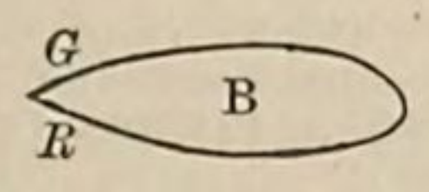
4. If A sees a *White mast-head light* above the *Red light*, he knows that the vessel is a steamer, and is either approaching in the same direction as B, or is crossing to port in the same direction as D D′ D″.

5. In the first position A sees B a little on the port bow; B's *red light* exposed, and, by the diagrams, B should see A's *red light* as well, in which case both vessels should put their helms to port.

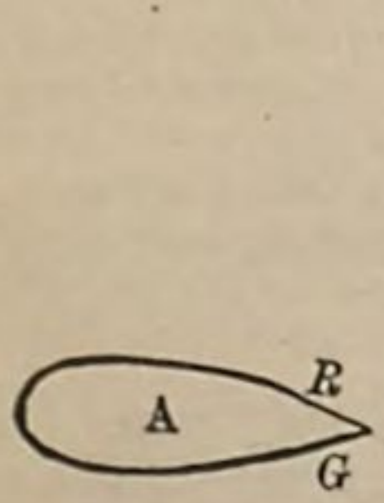
6. In the second positions A sees D on his starboard bow, and from the fact that he only sees D's *red light*, he knows that D must be steering in some direction as at D D′ D″; at the same time D D′ D″ will see A's *green light on his port bow*. In this case A having D clearly on his starboard bow, should put his helm to starboard to turn from D, and D having A clearly on his port bow, should put his helm to port to turn to starboard from A.

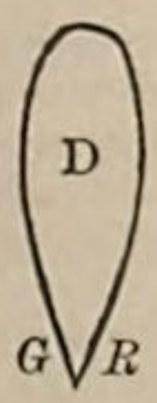
7. THIRD. When the *Green light* is seen, and the *Red light* is not seen.—A sees a *green* light ahead or on his bow; A knows that either, first, a vessel is approaching him on his starboard bow, as B,

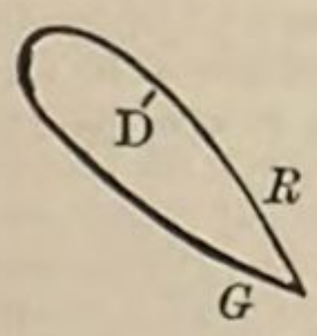


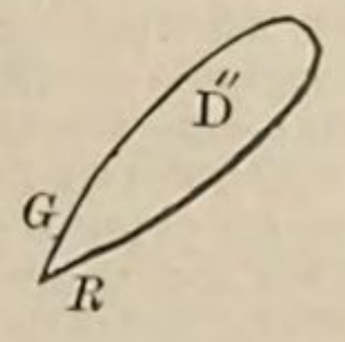


or, second, a vessel is crossing his bow in some direction to starboard, as D D′ D″.









8. If A sees a *White mast-head light* above the *Green light*, A knows that the vessel is a steamer, and is either approaching him in the same direction as B, or is crossing to starboard in some direction as D D′ D″.

9. In the *first position*, A sees B on his starboard bow; B's *green light* exposed, and, by the diagram, B should see A's green light as well, in which case both vessels should put their helms to starboard.

10. In the *second position*, A sees D on his port bow, and from the fact that he only sees D's *green light*, he knows that D must be steering in some direction as D D′ D″; at the same time D will see A's *red light* on his starboard bow. In this case, A having D clearly on his port bow, should put his helm to port to turn from D, and D having A clearly on his starboard bow, should put his helm to starboard to turn to port from A.

11. Steam-vessels discovering other vessels near them at night, should slow down, and, if need be, stop the engines until the exact position of both vessels is ascertained.

COLLISIONS—RULES OF THE SEA.

TITLE 48, CHAP. 5.

Sec. 4233. Rules for preventing collisions. Sec. 4234. Forfeiture of sailing-vessels for omission of lights.

Rules for preventing collisions.

SEC. 4233. The following rules for preventing collisions on the water, shall be followed in the navigation of vessels of the Navy and of the mercantile marine of the United States.

STEAM AND SAIL VESSELS.

Rule one. Every steam-vessel which is under sail, and not under steam, shall be considered a sail-vessel; and every steam-vessel which is under steam, whether under sail or not, shall be considered a steam-vessel.

LIGHTS.

Rule two. The lights mentioned in the following rules, and no others, shall be carried in all weathers, between sunset and sunrise.

Rule three. All ocean-going steamers, and steamers carrying sail, shall, when under way, carry—

(A) At the foremast head, a bright white light, of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least five miles, and so constructed as to show a uniform and unbroken light over an arc of the horizon of twenty points of the compass, and so fixed as to throw the light ten points on each side of the vessel, namely, from right ahead to two points abaft the beam on either side.

(B) On the starboard side, a green light, of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles, and so constructed as to show a uniform and unbroken light over an arc of the horizon of ten points of the compass, and so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side.

(C) On the port side, a red light, of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles, and so constructed as to show a uniform and unbroken light over an arc of the horizon of ten points of the compass, and so fixed as to throw the light from right ahead to two points abaft the beam on the port side.

The green and red lights shall be fitted with inboard screens, projecting at least three feet forward from the lights, so as to prevent them from being seen across the bow.

Rule four. Steam-vessels, when towing other vessels, shall carry two bright white mast-head lights vertically, in addition to their side-lights, so as to distinguish them from other steam-vessels. Each of these mast-head lights shall be of the same character and construction as the mast-head lights prescribed by Rule three.

Rule five. All steam-vessels, other than ocean-going steamers and steamers carrying sail, shall, when under way, carry on the starboard and port sides lights of the same character and construction and in the same position as are prescribed for side-lights by Rule three, except in the case provided in Rule six.

Rule six. River-steamers, navigating waters flowing into the Gulf of Mexico, and their tributaries, shall carry the following lights, namely: One red light on the out-

board side of the port smoke-pipe, and one green light on the outboard side of the starboard smoke-pipe. Such lights shall show both forward and abeam on their respective sides.

Rule seven. All coasting steam-vessels, and steam-vessels other than ferry-boats and vessels otherwise expressly provided for, navigating the bays, lakes, rivers, and other inland waters of the United States, except those mentioned in Rule six, shall carry the red and green lights, as prescribed for ocean-going steamers; and, in addition thereto, a central range of two white lights; the after-light being carried at an elevation of at last fifteen feet above the light at the head of the vessel. The head-light shall be so constructed as to show a good light through twenty points of the compass, namely: from right ahead to two points abaft the beam on either side of the vessel; and the after-light so as to show all around the horizon. The lights for ferry-boats shall be regulated by such rules as the Board of Supervising Inspectors of Steam-vessels shall prescribe.

Rule eight. Sail-vessels, under way or being towed, shall carry the same lights as steam-vessels under way, with the exception of the white mast-head lights, which they shall never carry.

Rule nine. Whenever, as in case of small vessels during bad weather, the green and red lights cannot be fixed, these lights shall be kept on deck, on their respective sides of the vessel, ready for instant exhibition, and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side, nor the red light on the starboard side. To make the use of these portable lights more certain and easy, they shall each be painted outside with the color of the light they respectively contain, and shall be provided with suitable screens.

Rule ten. All vessels, whether steam-vessels or sail-vessels, when at anchor in roadsteads or fairways, shall, between sunset and sunrise, exhibit where it can best be seen. but at a height not exceeding twenty feet above the hull, a white light in a globular lantern of eight inches in diameter, and so constructed as to show a clear, uniform, and unbroken light, visible all around the horizon, and at a distance of at least one mile.

Rule eleven. Sailing pilot-vessels shall not carry the lights required for other sailing-vessels, but shall carry a white light at the mast-head, visible all around the horizon, and shall also exhibit a flare-up light every fifteen minutes.

Rule twelve. Coal-boats, trading-boats, produce-boats, canal-boats, oyster-boats, fishing-boats, rafts, or other water-craft, navigating any bay, harbor, or river, by hand-power, horse-power, sail, or by the current of the river, or which shall be anchored or moored in or near the channel or fairway of any bay, harbor, or river, shall carry one or more good white lights, which shall be placed in such manner as shall be prescribed by the Board of Supervising Inspectors of Steam-vessels.

Rule thirteen. Open boats shall not be required to carry the side-lights required for other vessels, but shall, if they do not carry such lights, carry a lantern having a green slide on one side, and a red slide on the other side; and on the approach of or to other vessels, such lantern shall be exhibited in sufficient time to prevent collision, and in such a manner that the green light shall not be seen on the port side, nor the red light on the starboard side. Open boats, when at anchor or stationary, shall exhibit a bright white light. They shall not, however, be prevented from using a flare-up, in addition, if considered expedient.

Rule fourteen. The exhibition of any light on board of a vessel of war of the United States may be suspended whenever, in the opinion of the Secretary of the Navy, the commander-in-chief of a squadron, or the commander of a vessel acting singly, the special character of the service may require it.

FOG-SIGNALS.

Rule fifteen. Whenever there is a fog, or thick weather, whether by day or night, fog-signals shall be used as follows:

(A) Steam-vessels under way shall sound a steam-whistle placed before the funnel, not less than eight feet from the deck, at intervals of not more than one minute.

(B) Sail-vessels under way shall sound a fog-horn at intervals of not less than five minutes.

(C) Steam-vessels and sail-vessels, when not under way, shall sound a bell at intervals of not more than five minutes.

(D) Coal-boats, trading-boats, produce-boats, canal-boats, oyster-boats, fishing-boats, rafts, or other water-craft, navigating any bay, harbor, or river, by hand power, horse-power, sail, or by the current of the river, or anchored or moored in or near the channel or fairway of any bay, or harbor, or river, and not in any part, shall sound a fog-horn, or equivalent signal, which shall make a sound equal to a steam-whistle, at intervals of not more than two min tes.

STEERING AND SAILING RULES.

Rule sixteen. If two sail-vessels are meeting end on, or nearly end on, so as to involve risk of collision, the helms of both shall be put to port, so that each may pass on the port side of the other.

Rule seventeen. When two sail-vessels are crossing so as to involve risk of collision, then, if they have the wind on different sides, the vessel with the wind on the port side shall keep out of the way of the vessel with the wind on the starboard side, except in the case in which the vessel with the wind on the port side is close-hauled, and the other vessel free, in which case the latter vessel shall keep out of the way. But if they have the wind on the same side, or if one of them has the wind aft, the vessel which is to windward shall keep out of the way of the vessel which is to leeward.

Rule eighteen. If two vessels under steam are meeting end on, or nearly end on, so as to involve risk of collision, the helms of both shall be put to port, so that each may pass on the port side of the other.

Rule nineteen. If two vessels under steam are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

Rule twenty. If two vessels, one of which is a sail-vessel and the other a steam-vessel, are proceeding in such directions as to involve risk of collision, the steam-vessel shall keep out of the way of the sail-vessel.

Rule twenty-one. Every steam-vessel, when approaching another vessel, so as to involve risk of collision, shall slacken her speed, or, if necessary, stop and reverse; and every steam-vessel shall, when in a fog, go at a moderate speed.

Rule twenty-two. Every vessel overtaking any other vessel shall keep out of the way of the last-mentioned vessel.

Rule twenty-three. Where, by Rules seventeen, nineteen, twenty, and twenty-two, one of two vessels shall keep out of the way, the other shall keep her course, subject to the qualifications of Rule twenty-four.

Rule twenty-four. In construing and obeying these rules, due regard must be had to all dangers of navigation, and to any special circumstances which may exist in any particular case rendering a departure from them necessary in order to avoid immediate danger.

Forfeiture of sailing-vessels for omission of lights.

SEC. 4234. Collectors or other chief officers of the customs shall require all sail-vessels to be furnished with proper signal-lights, and every such vessel shall, on the approach of any steam-vessel during the night time, show a lighted torch upon that point or quarter to which such steam-vessel shall be approaching. Every such vessel that shall be navigated without complying with the provisions of this and the preceding section shall be liable to a penalty of two hundred dollars, one-half to go to the informer, for which sum the vessel so navigated shall be liable, and may be seized and proceeded against by way of libel in any district court of the United States having jurisdiction of the offense.

PILOT RULES FOR LAKE AND SEABOARD.

Rules and regulations for the government of pilots navigating seas, gulfs, lakes, bays, sounds, or rivers, except rivers flowing into the Gulf of Mexico, and their tributaries. Revised and adopted by the Board of Supervising Inspectors June 10, 1871, *as authorized by act of Congress to provide for the better security of life on board of vessels propelled in whole or in part by steam, and for other purposes, approved February* 28, 1871, *to take effect January* 1, 1872. (*Amended January*, 1875.)

RULE I.—When steamers are approaching each other "head and head," or nearly so, it shall be the duty of each steamer to pass to the right, or on the port side of the other; and the pilot of either steamer may be first in determining to pursue this course, and thereupon shall give, as a signal of his intention, one short and distinct blast of his steam-whistle, which the pilot of the other steamer shall answer promptly by a similar blast of his steam-whistle, and thereupon such steamers shall pass to the right, or on the port side of each other. But if the course of such steamers is so far on the starboard of each other as not to be considered by the pilots as meeting "head and head," or nearly so, or if the vessels are approaching each other in such a manner that passing to the right (as above directed) is deemed unsafe by the pilot of either vessel, the

pilot so first deciding shall immediately give two short and distinct blasts of his steam-whistle, which the pilot of the other steamer shall answer promptly by two similar blasts of his steam-whistle, and they shall pass to the left, or on the starboard side of each other.

NOTE.—In the night, steamers will be considered meeting "head and head" so long as both the colored lights of each are in view of the other. In the day, a similar position will also be considered "head and head."

RULE II.—When steamers are approaching each other in an oblique direction (as shown in diagram of the fifth situation), they shall pass to the right of each other, as if meeting "head and head," or nearly so, and the signals by whistle shall be given and answered promptly, as in that case specified.

RULE III.—If, when steamers are approaching each other, the pilot of either vessel fails to understand the course or intention of the other, whether from the signals being given or answered erroneously, or from other causes, the pilot so in doubt shall immediately signify the same by giving several short and rapid blasts of the steam-whistle; and if the vessel shall have approached within half a mile of each other, both shall be immediately slowed to a speed barely sufficient for steerage-way, until the proper signals are given, answered, and understood, or until the vessels shall have passed each other.

RULE IV.—When steamers are running in a fog or thick weather, it shall be the duty of the pilot to cause a long blast of the steam-whistle to be sounded, at intervals not exceeding one minute, and no steamer shall, in any case, be justified in coming in collision with another vessel if it be possible to avoid it.

RULE V.—Whenever a steamer is nearing a short bend or curve in the channel, where, from the height of the banks or other cause, a steamer approaching from the opposite direction cannot be seen for a distance of half a mile, the pilot of such steamer, when he shall have arrived within half a mile of such curve or bend, shall give a signal by one long blast of the steam-whistle, which signal shall be answered by a similar blast, given by the pilot of any approaching steamer that may be within hearing.

Should such signal be so answered by a steamer upon the farther side of such bend, then the usual signals for meeting and passing shall immediately be given and answered; but if the first alarm-signal of such pilot be not answered, he is to consider the channel clear and govern himself accordingly.

RULE VI.—The signals, by blowing of the steam-whistle, shall be given and answered by pilots in compliance with these rules not only when meeting "head and head," or nearly so, but at all times when passing or meeting at a distance within half a mile of each other, and whether passing to the starboard or port.

N. B.—The foregoing rules are to be complied with in all cases, except when steamers are navigating in a crowded channel, or in the vicinity of wharves; under such circumstances steamers must be run and managed with great caution, sounding the whistle, as may be necessary, to guard against collision or other accidents.

RULE VII.—All steamers rigged for carrying sail, when under way, must carry a bright white light at the foremast head, and all other steamers must carry a bright white light on the stem or near the bow, and another on a mast near the stern, or on the flagstaff at the stern, the last named being at an elevation of at least twenty feet above all other lights upon the steamer. All steamers must carry a green light upon the starboard side and a red light on the port side.

NOTE.—Steamers, although rigged for carrying sail, instead of the foremast head-light, may adopt the forward and stern lights provided for steamers not rigged for carrying sail, provided said lights are so arranged and placed on the vessel as to secure the contemplated objects.

When at anchor, a bright white light shall be exhibited at least twenty feet above the surface of the water, the lantern so constructed and placed as to show a good light all around the horizon.

RULE VIII.—That when two steamers are approaching the narrows known as "Hell-gate," on the East River, at New York, side by side, or nearly so, running in the same direction, the steamer on the right or starboard hand of the other (when approaching from the west), when they shall have arrived abreast of the north end of Blackwell's Island, shall have the right of way, and the steamer on the left or port side of the other shall check her way and drop astern. In like case, when two steamers are approaching from the east, and are abreast of Negro Point, the steamer on the right or starboard hand of the other shall have the right of way, and shall proceed on her course without interference, and the steamer on the port side of the other shall keep at a safe distance astern (not less than three lengths) until both steamers have passed through the difficult channel.

RULE IX.—Steam-vessels, when towing other vessels, shall carry two bright white mast-head lights vertically, in addition to their side lights, so as to distinguish them from other steam-vessels. Each of these mast-head lights shall be of the same construction and character as the mast-head lights which other steam-vessels are required

to carry; and in addition to the lights herein referred to, when engaged in towing canal-boats and barges, or both, as is customary on the Hudson and other rivers, white lights shall also be carried on the extreme outside of the tow on either hand, and also on the extreme afterpart of the same.

RULE X.—When steamers are running in a fog or thick weather, and the pilot elects to lay by, or, as it is usual to say, drift, or if at anchor, with steam up, in the fairway of other steamers, it shall be the duty of the pilot to cause three distinct blasts of the steam-whistle to be sounded at intervals not exceeding three minutes: *Provided, however*, That nothing herein shall be construed to, in any way, conflict with Rule IV, regulating fog-signals, when under way.

NOTE.—The object of this rule is to give timely notice to approaching steamers that the steamer giving such signal is lying still or at anchor, as the case may be, in thick weather.

1. The mast-head light of steamers rigged for carrying sail to be visible at a distance of at least five miles on a clear, dark night, and the lantern to be so constructed as to show a uniform and unbroken light over an arc of the horizon of twenty points of the compass, viz, from right ahead to two points abaft the beam on either side of the ship.

2. The stem and stern lights of steamers not rigged for carrying sail to be visible at a distance of at least five miles on a clear, dark night, and the respective lanterns to be so constructed that the stem light shall show a uniform and unbroken light over an arc of the horizon of twenty points of the compass, viz, from right ahead to two points abaft the beam on either side of the ship, and that the stern-lights shall show a uniform light all around the horizon.

3. The colored side-lights to be visible at a distance of at least two miles on a clear, dark night, and the lanterns to be so constructed as to show a uniform and unbroken light over an arc of the horizon of ten points of the compass, viz, from right ahead to two points abaft the beam on their respective sides.

4. The side-lights are to be fitted with inboard screens of at least three feet in length (clear of the lantern), to prevent them from being seen across the bow, the screens to be placed in a fore-and-aft line with the inner edge of the side-lights, and in contact therewith.

NOTE 1st.—The object of carrying the bright white light at the foremast-head of steamers rigged for carrying sail is merely to intimate to other vessels the approach or presence of such steamers.

NOTE 2d.—The object of the colored lights required to be carried on all steamers is to indicate to other vessels the course or direction such steamer may be steering.

NOTE 3d.—The object of requiring steamers not rigged for carrying sail to carry a white stern-light, in connection with a white light on the stem or near the bow, is to provide (when the vessel's rig will admit of it), by a central range of lights, a method of determining more correctly the course that such vessel is steering.

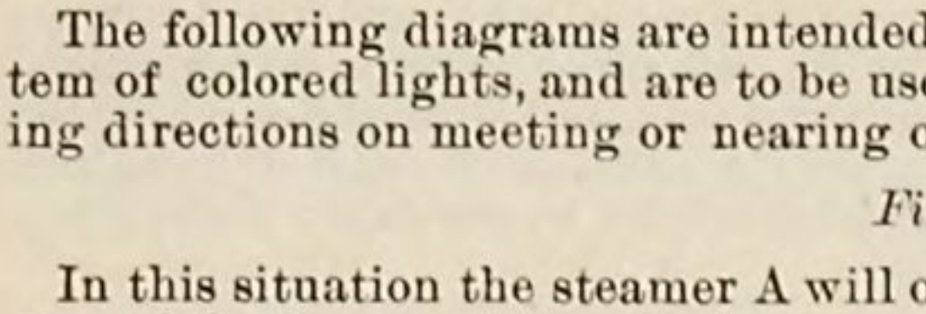
RULE IX. When steamers are running in the same direction, and the pilot of the steamer which is astern shall desire to pass on the right or starboard hand of the steamer ahead, he shall give one short blast of the steam-whistle as a signal of such disire and intention, and shall put his helm to port; and the pilot of the steamer ahead shall answer by the same signal, or, if he prefer to keep on his course, he shall make the necessary signals, and the boat wishing to pass must govern herself accordingly but the boat ahead shall in no case attempt to cross her bow or crowd upon her course.

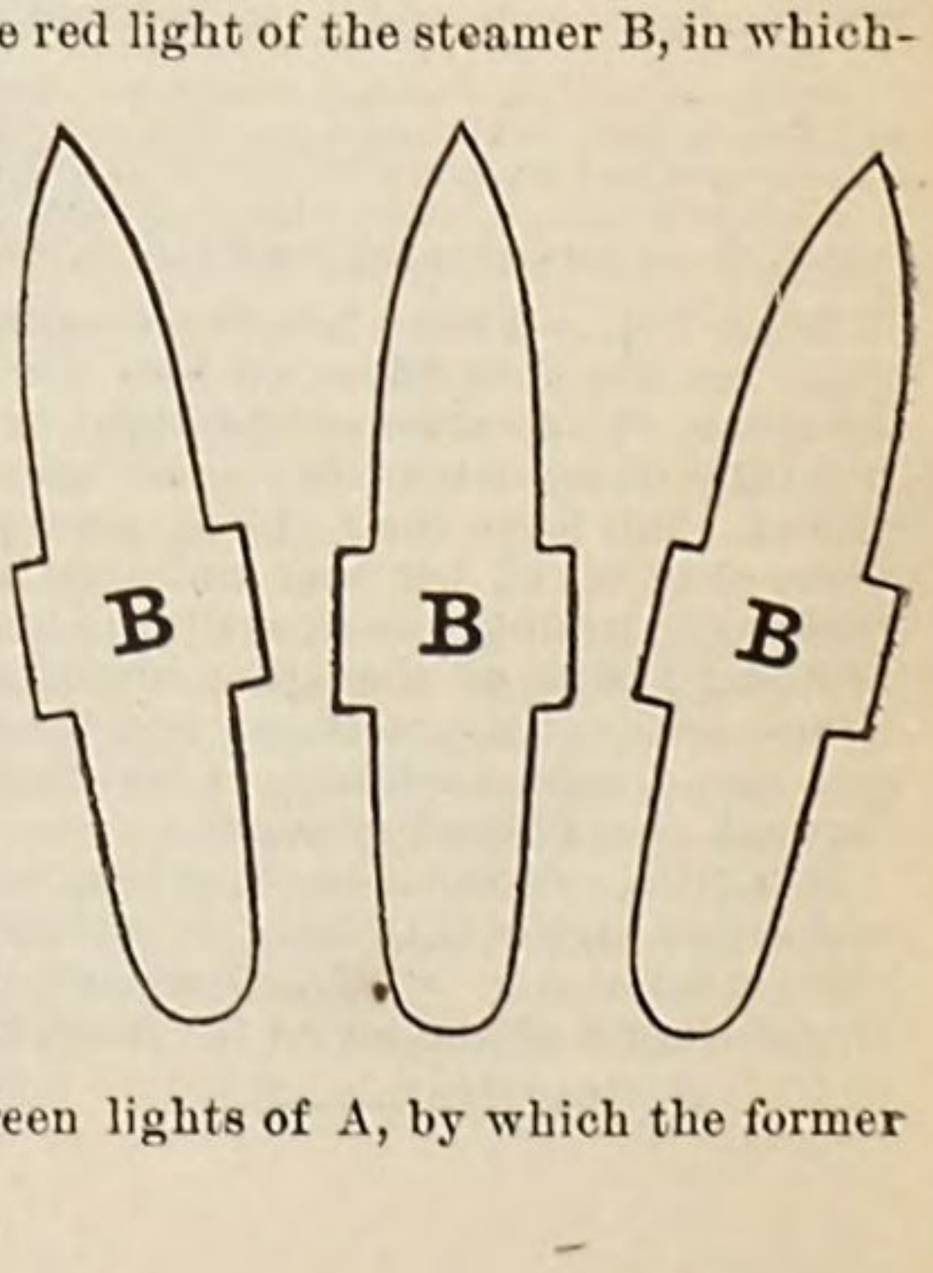
DIAGRAMS.

The following diagrams are intended to illustrate the working of the foregoing system of colored lights, and are to be used by pilots, in connection with the rules as sailing directions on meeting or nearing other steamers:

First situation.

In this situation the steamer A will only see the red light of the steamer B, in whichever of the three positions the latter may happen to be, because the green light will be hid from view; A will be assured that the port side of B is toward him, and that the latter is therefore crossing the bows of A in some direction to port;





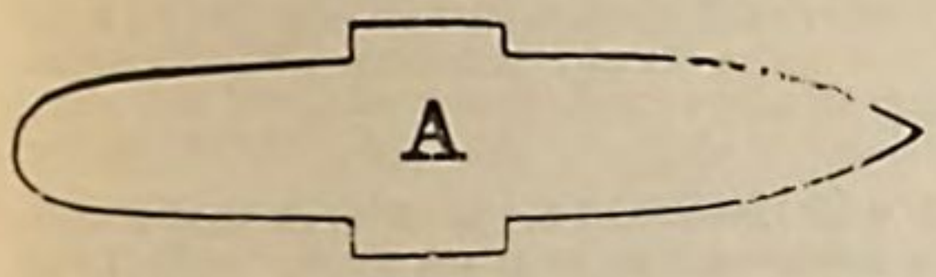
A will therefore (if so near as to fear collision) port his helm with confidence and pass clear. On the other hand, the steamer B, in either of the three positions, will see both the red and green lights of A, by which the former

will know that a steamer is approaching directly toward him; B will act accordingly, and keep away if necessary.

Second situation.

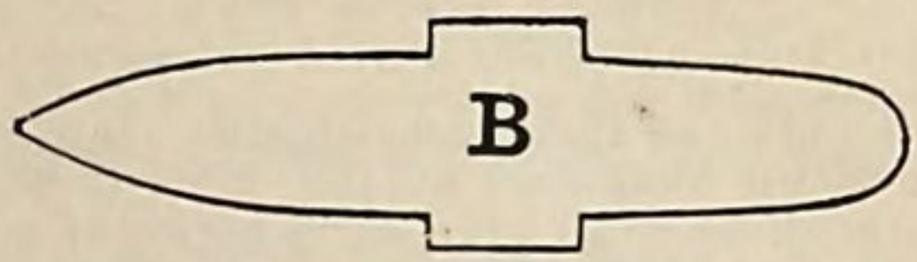
Here A will see B's green light only, which will clearly indicate to the former that B is crossing to starboard. Again both the colored lights of A being visible to B, will apprise the latter that a steamer is steering directly toward him. If necessary, A shall starboard his helm; and if so near as to fear collision, the boat shall be slowed and stopped.

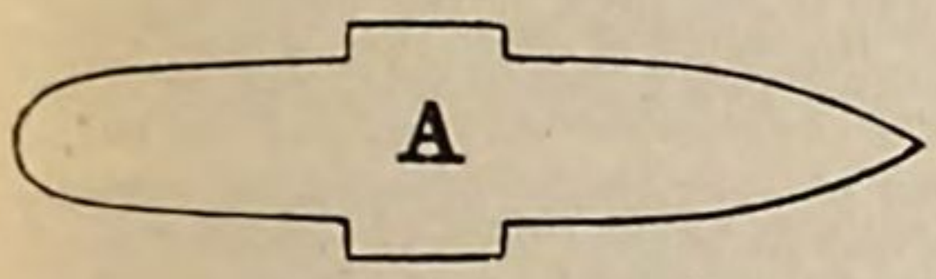




Third situation.

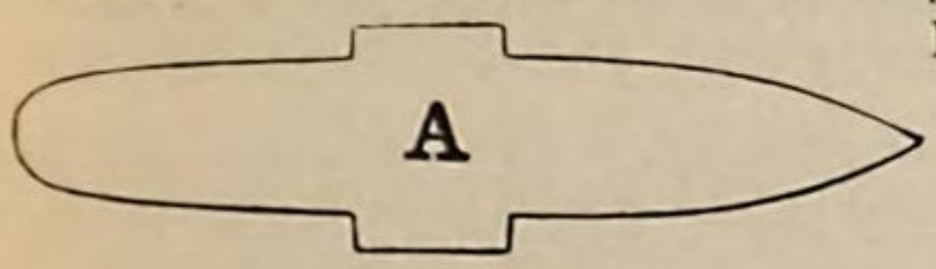
A and B will see each other's red light only, the screens preventing the green lights from being seen. Both vessels are evidently passing to port, which is rulable in this situation, each pilot having previously signified his intention by one blast of the steam-whistle.

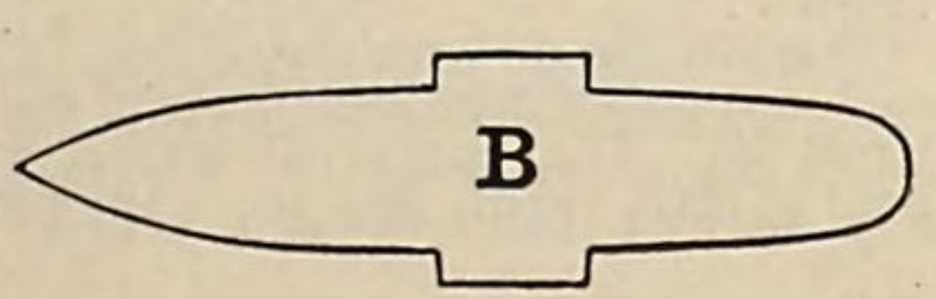




Fourth situation..

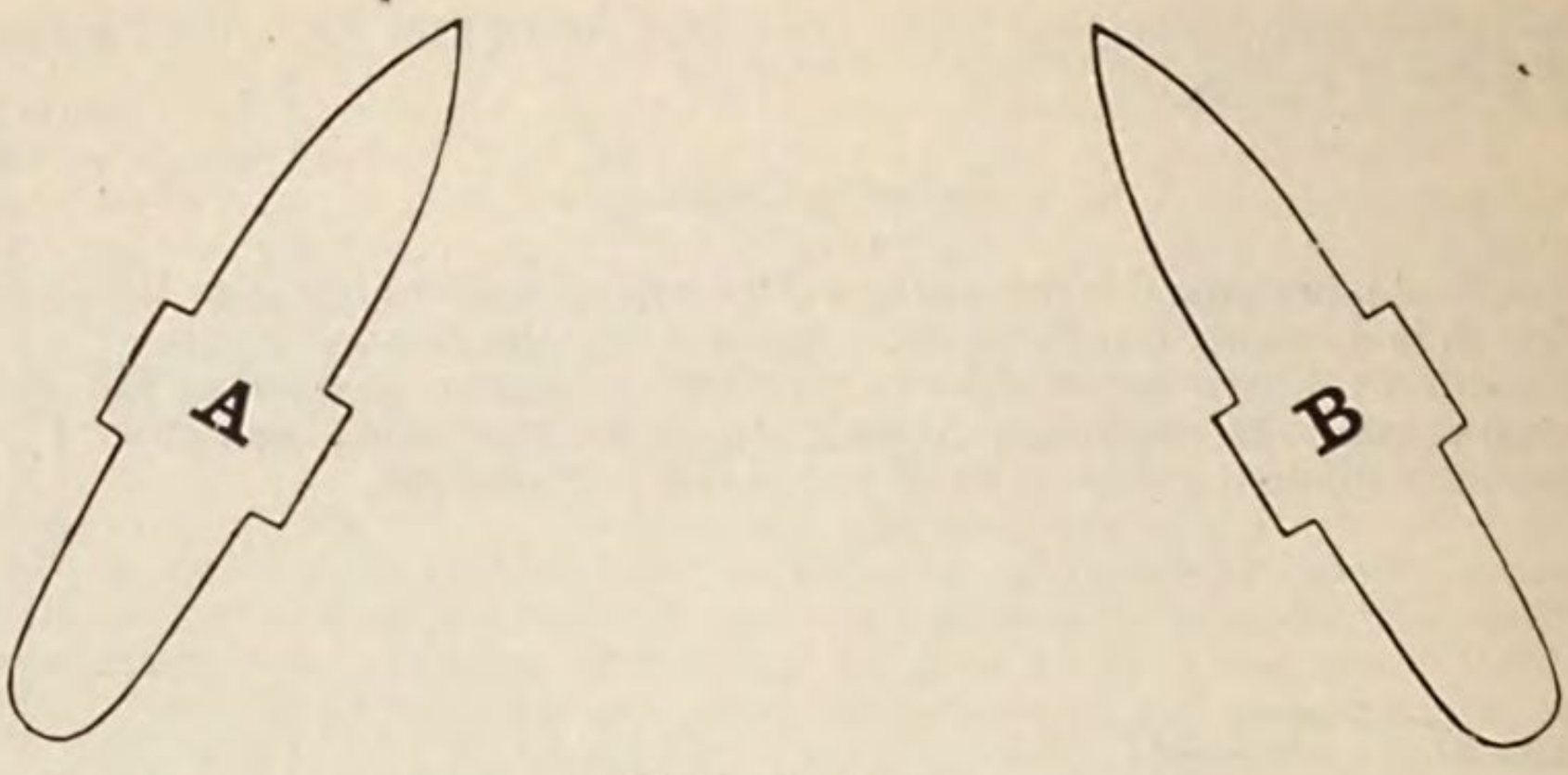
Here the green light only will be visible to each, the screens preventing the red light from being seen. They are, therefore, passing to starboard, which is rulable in this situation, each pilot having previously signified his intention by two blasts of the steam-whistle.





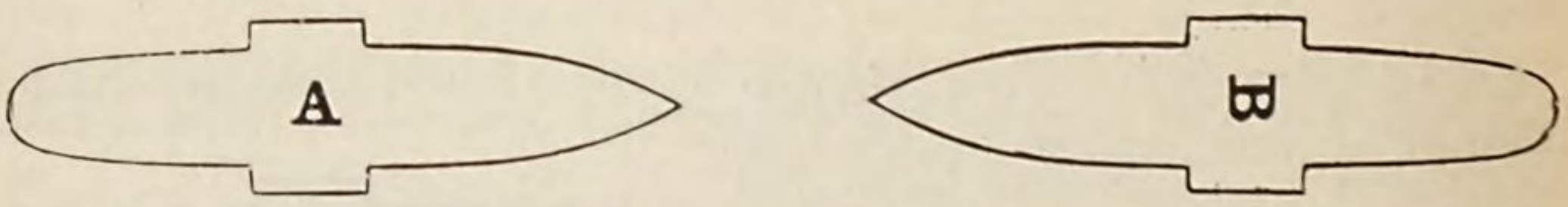
Fifth situation.

This is a situation requiring great caution; the red light of B in view to A, and the green light of A in view to B, will inform both that they are approaching each other in an oblique direction. A should put his helm to port, according to the standing rule mentioned in the next or sixth situation, and pass astern of B, while B should continue on his course, or port his helm, if necessary, to avoid collision, each having previously given one blast of the steam-whistle, as required by the rule, when passing to the right.



Sixth situation.

Here the two colored lights, visible to each, will indicate their direct approach ("head and head") toward each other. In this situation it is a standing rule that both shall put their helms to port and pass to the right, each having previously given



one blast of the steam-whistle. But when for good reasons, in rivers and narrow and difficult channels, a pilot finds it necessary to deviate from the standing rule just stated, he shall give early notice of such intention to the pilot of the other steamer by giving two blasts of the steam-whistle, and the pilot of the other vessel shall answer promptly with two blasts of his whistle, and both boats shall pass to the left, as shown in the fourth situation.

The manner of fixing the colored lights should be particularly attended to. They will require to be fitted each with a screen of wood or canvas, on the inboard side, and close to the light, in order to prevent both being seen at the same moment from any direction but that of right ahead.

This is important, for without the screen any plan of bow-lights would be ineffectual as a means of indicating the direction of steering. This will be readily understood by a reference to the preceding illustrations, where it will appear evident that in any situation in which two vessels may approach each other in the dark, the colored lights will instantly indicate to both the relative course of each—that is, each will know whether the other is approaching directly, or crossing the bows either to starboard or to port.

This intimation, with the signals by whistle as provided, is all that is required to enable vessels to pass each other in the darkest night with almost equal safety as in broad day. If at anchor, all vessels, without distinction, must exhibit a bright white light at least twenty feet above the surface of the water.

PILOT RULES FOR WESTERN RIVERS.

Rules and regulations for the government of pilots of steamers navigating the rivers flowing into the Gulf of Mexico, and their tributaries. Revised and adopted by the Board of Supervising Inspectors June 12, 1871, *as authorized by act of Congress to provide for the better security of life on board of vessels propelled in whole or in part by steam, and for other purposes, approved February* 28, 1871, *to take effect January* 1, 1872. (*Amended January*, 1875.)

RULE I.—When steamers are approaching each other, the signal for passing shall be one sound of the steam-whistle to keep to the right, and two sounds of the steam-whistle to keep to the left. These signals to be made first by the ascending steamer. If the dangers of navigation, darkness of the night, narrowness of the channel, or any other cause, render it necessary for the descending boat to take the other side, she can do so by making the necessary signals, and the ascending steamer must govern herself accordingly. These signals to be observed by all steamers, either day or night.

RULE II.—Should steamers be likely to pass near each other, and these signals should not be made and answered by the time such boats shall have arrived at the distance of eight hundred yards from each other, the engines of both boats shall be stopped; or should the signal be given and not properly understood, from any cause whatever, both boats shall be backed until their headway shall be fully checked, and the engines shall not be again started ahead until the proper signals are made, answered, and understood. Doubts or fears of misunderstanding signals shall be expressed by several short sounds of the whistle in quick succession.

RULE III.—When two boats are about to enter a narrow channel at the same time, the ascending boat shall be stopped below such channel until the descending boat shall have passed through it; but should two boats unavoidably meet in such a channel, then it shall be the duty of the pilot of the ascending boat to make the proper signals, and, when answered by the descending boat, to lie as close as possible to the side of the channel the exchange of signals may have determined, as allowed by Rule I, and either stop the engines or move them so as only to give the boat steerage-way, and the pilot of the descending boat shall cause his boat to be worked slowly until he has passed the ascending boat.

RULE IV.—When a steamer is ascending and running close on a bar or shore, the pilot shall in no case attempt to cross the river when a descending boat shall be so near that it would be possible for a collision to ensue therefrom.

RULE V.—No pilot of a descending steamer shall run down any island chute which is not the usual channel of the river, except such chutes as are designated by these rules, or may hereafter be designated to the Board of Supervising Inspectors.

RULE VI.—When any steamer, whether ascending or descending, is nearing a short bend or point where, from any cause, a steamer approaching in an opposite direction cannot be seen at a distance of six hundred yards, the pilot of such steamer, when he shall have arrived within six hundred yards of that bend or point, shall give a signal of one long sound of his steam-whistle as a notice to any steamer that may be approaching; and should there be any approaching steamer within hearing of such signal, it shall be the duty of the pilot thereof to answer such signals by one long sound of his steam-whistle, when both boats shall be navigated with the proper precautions, as required by preceding rules.

RULE VII.—When a steamer is running in a fog or thick weather, it shall be the duty of the pilot to sound his steam-whistle at intervals not exceeding one minute.

RULE VIII.—When steamers are running in the same direction, and the pilot of the boat which is astern shall desire to pass either side of the boat ahead, he shall give the signal as in Rule I, and the pilot of the boat ahead shall answer by the same signal, or if he prefer to keep on his course, he shall make the necessary signals, and the boat wishing to pass must govern herself accordingly; but the boat ahead shall in no case attempt to cross her bow or crowd upon her course.

RULE IX.—When boats are moving from their docks or berths, and other boats are liable to pass from any direction towards them, they shall give the same signal as in case of boats meeting at a bend; but immediately after clearing the berth so as to be fully in sight, they shall be governed by Rule II.

RULE X.—All barges, when towed by steamers and navigated between sunset and sunrise, shall have their signal-lights, as required by law, placed in a suitable manner on the starboard bow of the starboard barge and on the port bow of the port barge, which lights shall not be less than ten feet above the surface of the water.

RULE XI.—Steamers descending the Ohio and Mississippi Rivers, between Louisville, Kentucky, and New Orleans, Louisiana, shall not run down any island chute, either by day or night, except those herein or hereinafter designated, unless such chutes are the usual channel of the river.

RULE XII.—The following island chutes may be navigated by descending steamers on the Ohio River between Louisville, Kentucky, and Cairo, Illinois, when the river shall be sufficiently high for them to do so with safety, viz: Blue River Island, Diamond Island, Golconda Island, Sister Islands, Stewart's Island, and Cumberland Island, either by day or night, and Wabash Island chute by daylight only.

RULE XIII.—All steamers descending the Mississippi River between Cairo and New Orleans may, in daylight, run any chute which has sufficient water for the purpose, and is free from obstructions.

RULE XIV.—All steamers descending the Mississippi River between Cairo and New Orleans during the time between sunset and sunrise, must keep the main channel, except in times of high water.

RULE XV.—Ascending steamers are not prohibited from running any island chutes.

RULE XVI.—Signal-lights for steamers under way are provided by law as follows, the same to be carried between sunset and sunrise:

For ocean steamers and steamers carrying sail, a bright white light at the foremast head, to throw the light through ten points of the compass on each side of the ship, viz, from right ahead to two points abaft the beam, and to be visible at least five miles. On the starboard side a green light, and on the port side a red light, each to

throw the light through ten points of the compass on their respective sides, viz, from right ahead to two points abaft the beam, and to be visible at least two miles. These colored lights are to be fitted with inboard screens, projecting at least three feet forward from the light, to prevent them from being seen across the bow.

For steamers navigating waters flowing into the Gulf of Mexico, a red light on the outboard side of the port smoke-pipe, and a green light on the outboard side of the starboard smoke-pipe—these lights to show both forward and abeam on their respective sides.

For coasting steamers and those navigating bays, lakes, or other inland waters, other than ferry-boats and those above provided for, the red and green side-lights as prescribed for ocean steamers, and a central range of two white lights, the after-light being carried at an elevation of at least fifteen feet above the light at the head of the vessel; the head-light to show through twenty points of the compass, viz, from right ahead to two points abaft the beam on either side of the vessel; and the after-light to show all around the horizon.

For steamers towing other vessels, the colored lights will be the same as prescribed for ocean steamers; and two white mast-lights shall also be carried vertically, to distinguish them from other steamers; the white lights to show through twenty points of the compass, viz, from right ahead to two points abaft the beam on either side of the vessel; white lights shall also be placed on the extreme outside of the tow on either hand, and also on the extreme afterpart of the same.

RULE XVII.—A bright white light not exceeding twenty feet above the hull shall be exhibited by all steamers, when at anchor, between sunset and sunrise, in a globular lantern of eight inches in diameter, so placed as to throw a good light all around the horizon.

RULE XVIII.—Steam ferry-boats with two chimneys shall, in all cases, carry the same signal-lights as passenger steamers.

RULE XIX.—All other steamers, ferry or otherwise, having but one chimney, shall have brackets securely fastened to each side of the same, so as to carry the red and green lights the same as passenger steamers.

RULE XX.—When the license of a pilot is suspended or revoked he shall not act as steersman, or take part in the navigation of any steamer, during the time for which his license has been suspended or revoked.

RULE XXI.—The following points and bends in the Chattahoochie, Flint, and Apalachicola Rivers in the States of Florida and Georgia, are considered dangerous, and steamboats when navigating down stream must not make them "by the run."

Short's Roads, Munroe's, Francis, upper and lower, Grace's, Prospect Bluff, Fort Gaines, T. T. Smith, and Smith and King's Rocks, on the Chattahoochie; Horseshoe, upper and lower, on the Flint; Devil's Elbow, upper and lower, and Cold Shades, on the Apalachicola.

RULE XXII.—The line dividing jurisdiction between pilot rules on Western rivers and lakes and seaboard at New Orleans shall be a line drawn directly across the river from Jackson monument in Jackson square.

RULES RECOMMENDING CERTAIN FOG-SIGNALS TO BE OBSERVED BY STEAMERS, SAILING-VESSELS, AND OTHER CRAFT.

Every steamer when under way shall use a steam-whistle. Sailing vessels and all other craft propelled by sails, shall use a fog-horn.

Whenever there is a fog, whether by day or night, the fog-signals described below shall be sounded.

Sailing vessels and every craft propelled by sails, upon the ocean, lakes, and rivers-shall, when on their starboard tack, sound one blast of their fog-horn; when on their port tack, they shall sound two blasts of their fog-horn; when with the wind free, or running large, they shall sound three blasts of their fog-horn; when lying-to or at anchor, they shall sound *the bell*. In each instance the above signals shall be sounded at intervals of not more than two minutes.

Sailing vessels, when not under way, and anchored or moored in the channel or fairway of commerce, shall sound *the bell* signal at intervals of not more than two minutes; and all steamers navigating in a fog or thick weather shall, by the rules governing pilots, sound their steam-whistle at intervals of not more than one minute.

Sailing vessels shall at all times, on the approach of any steamer during the night-time, show a lighted torch upon that point or quarter to which such steamer shall be approaching. And upon any craft navigating rivers without being in tow of a steamer, such as rafts, flat-boats, wood-boats, and other like craft, they shall sound a fog-horn at intervals of not more than two minutes.

It shall at all times be the duty of steamers to give to the sailing vessel, or other craft propelled by sails, every advantage, and keep out of her way.

NEW RULES.

At the court at Osborne House, Isle of Wight, the 14th day of August, 1879. Present, the Queen's most excellent majesty in council.

Whereas, by the "Merchant Shipping Act amendment act, 1862," it was enacted that on and after the 1st day of June, 1863, or such later day as might be fixed for the purpose by order in council, the regulations contained in the table marked C in the schedule to the said act should come into operation, and be of the same force as if they were enacted in the body of the said act; but that Her Majesty might from time to time, on the joint recommendation of the admiralty and the board of trade, by order in council, annul or modify any of the said regulations, or make new regulations in addition thereto or in substitution therefor; and that any alterations in or additions to such regulations made in manner aforesaid should be of the same force as the regulations in the said schednle;

And whereas, by the same act, it was further provided that whenever it should be made to appear to Her Majesty that the government of any foreign country was willing that the regulations for preventing collisions, contained in Table C in the schedule to the said act, or such other regulations for preventing collisions as are for the time being in force nnder the said act, should apply to the ships of such country when beyond the limits of British jurisdiction, Her Majesty might, by order in council, direct that such regulations should apply to the ships of the said foreign country, whether within British jurisdiction or not; and it was further provided by the said act that whenever an order in council had been issued applying any regulation made by or in pursuance of the said act to the ships of any foreign country, such ships should, in all cases arising in any British court, be deemed to be subject to such regulation, and should, for the purpose of such regulation, be treated as if they were British ships;

And whereas, by an order in council made in pursuance of the said recited act, and dated the 9th day of January, 1863, Her Majesty was pleased to direct—first, that the regulations contained in the schedule to the said act should be modified by the substitution for such regulations of certain regulations appended to the said order; secondly, that the said regulations appended to the said order should, on and after the 1st day of June, 1863, apply to French ships, whether within British jurisdiction or not.

And whereas, by several orders in council subsequently made, Her Majesty was pleased to direct that the regulations appended to the said order of the 9th of January, 1863, should apply to ships of the countries specified in the said orders, whether within British jurisdiction or not;

And whereas, by order in council dated the 30th day of July, 1868, Her Majesty, on the joint recommendation of the admiralty and the board of trade, was pleased to make certain additions to the regulations appended to the said first recited order in council, for the purpose of explaining articles 11 and 13 of the said regulations, and of removing doubt and misapprehension concerning the effect of the said two articles;

And whereas the admiralty and the board of trade have jointly recommended to Her Majesty that the regulations contained in the order in council dated the 9th day of January, 1863, and the additions to the said regulations contained in the said order in council of the 30th day of July, 1868, shall be annulled from the 1st day of September, 1880, and that there shall be substituted for the said regulations and additions respectively the new regulations hereinafter set forth;

And whereas it has been made to appear to Her Majesty that the governments of the several foreign countries mentioned in the second schedule hereto are respectively willing that the regulations contained in the first schedule hereto shall apply to ships of the said countries respectively, whether within British jurisdiction or not:

Now, therefore, Her Majesty, by virtue of the powers vested in her by the said recited act, and by and with the advice of her privy council, is pleased to direct—

First, that on and after the 1st day September, 1880, the regulations appended to the said order in council on the 9th day of January, 1863, and the additions to the said regulations contained in the said order in council of the 30th day of July, 1868, shall be annulled, and that there shall be substituted for the said regulations and additions respectively the new regulations contained in the first schedule hereto.

Second, that the said regulations contained in the said first schedule hereto shall, from and after the 1st day of September, 1880, apply to ships of the countries mentioned in the said second schedule hereto, whether within British jurisdiction or not.

C. L. PEEL.

FIRST SCHEDULE.

REGULATIONS FOR PREVENTING COLLISIONS AT SEA.

ARTICLE 1.

Preliminary.

In the following rules every steamship which is under sail and not under steam is to be considered a sailing ship; and every steamship which is under steam, whether under sail or not. is to be considered a ship under steam.

ARTICLE 2.

Rules concerning lights.

The lights mentioned in the following articles, numbered 3, 4, 5, 6, 7, 8, 9, 10, and 11, and no others, shall be carried in all weathers from sunset to sunrise.

ARTICLE 3.

A seagoing steamship when under way shall carry—

(*a*) On or in front of the foremast, at a height above the hull of not less than 20 feet, and if the breadth of the ship exceeds 20 feet then at a height above the hull not less than such breadth, a bright white light, so constructed as to show an uniform and unbroken light over an arc of the horizon of 20 points of the compass; so fixed as to throw the lights 10 points on each side of the ship, viz, from right ahead to two points abaft the beam on either side; and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least five miles.

(*b*) On the starboard side, a green light, so constructed as to show an uniform and unbroken light over an arc of the horizon of 10 points of the compass; so fixed as to throw the light from right ahead to 2 points abaft the beam on the starboard side; and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(*c*) On the port side, a red light, so constructed as to show an uniform and unbroken light over an arc of the horizon of 10 points of the compass; so fixed as to throw the light from right ahead to 2 points abaft the beam on the port side; and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(*d*) The said green and red side lights shall be fitted with inboard screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

ARTICLE 4.

A steamship, when towing another ship, shall, in addition to her side lights, carry two bright white lights in a vertical line one over the other, not less than three feet apart, so as to distinguish her from other steamships. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light which other steamships are required to carry.

ARTICLE 5.

A ship, whether a steamship or a sailing ship, when employed either in laying or in picking up a telegraph cable, or which from any accident is not under command, shall at night carry, in the same position as the white light which steamships are required to carry, and if a steamship in place of that light three red lights in globular lanterns, each not less than 10 inches in diameter, in a vertical line one over the other, not less than three feet apart; and shall by day carry in a vertical line one over the other, not less than three feet apart, in front of but not lower than her foremast head three black balls or shapes, each two feet in diameter.

These shapes and lights are to be taken by approaching ships as signals, that the ship using them is not under command, and cannot therefore get out of the way.

The above ships when not making any way through the water, shall not carry the side lights, but when making way shall carry them.

ARTICLE 6.

A sailing ship under way or being towed, shall carry the same lights as are provided by article 3 for a steamship under way, with the exception of the white light, which she shall never carry.

ARTICLE 7.

Whenever as in the case of small vessels during bad weather, the green and red side lights cannot be fixed, these lights shall be kept on deck on their respective sides of the vessel ready for use; and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side.

To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

ARTICLE 8.

A ship, whether a steamship or a sailing ship when at anchor, shall carry where it can best be seen, but at a height not exceeding 20 feet above the hull a white light, in a globular lantern of not less than eight inches in diameter, and so constructed as to show a clear, uniform, and unbroken light, visible all round the horizon at a distance of at least one mile.

ARTICLE 9.

A pilot vessel, when engaged on her station on pilotage duty, shall not carry the lights required for other vessels, but shall carry a white light at the mast-head, visible all round the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals, which shall never exceed fifteen minutes.

A pilot vessel, when not engaged on her station on pilotage duty, shall carry lights similar to those of other ships.

ARTICLE 10.

(*a*) Open fishing-boats and other open boats when under way shall not be obliged to carry the side lights required for other vessels; but every such boat shall, in lieu thereof, have ready at hand a lantern with a green glass on the one side and a red glass on the other side; and on the approach of or to other vessels such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side, nor the red light on the starboard side.

(*b*) A fishing-vessel and an open boat when at anchor, shall exhibit a bright white light.

(*c*) A fishing-vessel when employed in drift-net fishing, shall carry on one of her masts two red lights in a vertical line one over the other, not less than three feet apart.

(*d*) A trawler at work shall carry on one of her masts two lights in a vertical line one over the other, not less than three feet apart, the upper light red and the lower green, and shall also either carry the side lights required for other vessels, or, if the side lights cannot be carried, have ready at hand the colored lights, as provided in article 7, or a lantern with a red and green glass, as described in paragraph (*a*) of this article.

(*e*) Fishing-vessels and open boats shall not be prevented from using a flare-up in addition, if they desire to do so.

(*f*) The lights mentioned in this article are substituted for those mentioned in the 12th, 13th, and 14th articles of the convention between France and England scheduled to the British Sea Fisheries Act, 1868.

(*g*) All lights required by this article, except side lights, shall be in globular lanterns, so constructed as to show all round the horizon.

ARTICLE 11.

A ship which is being overtaken by another shall show from her stern to such last-mentioned ship a white light or a flare-up light.

Sound signals for fog, &c.

ARTICLE 12.

A steamship shall be provided with a steam-whistle or other efficient steam sound signal, so placed that the sound may not be intercepted by any obstructions, and with an efficient fog-horn to be sounded by a bellows or other mechanical means, and also with an efficient bell. A sailing-ship shall be provided with a similar fog-horn and bell.

In fog, mist, or falling snow, whether by day or night, the signals described in this article shall be used as follows; that is to say:

(*a*) A steamship under way shall make with her steam-whistle, or other steam sound signal, at intervals of not more than two minutes, a prolonged blast.

(*b*) A sailing ship under way shall make with her fog-horn, at intervals of not more than two minutes, when on the starbord tack one blast, when on the port tack two blasts in succession, and when with the wind abaft the beam three blasts in succession.

(*c*) A steamship and sailing ship, when not under way, shall, at intervals of not more than two minutes, ring the bell.

ARTICLE 13.

Speed of ships to be moderate in fog, &c.

Every ship, whether sailing ship or steamship, shall, in a fog, mist, or falling snow, go at a moderate speed.

ARTICLE 14.

Steering and sailing rules.

When two sailing ships are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other, as follows, viz:

(*a*) A ship which is running free shall keep out of the way of a ship which is close-hauled.

(*b*) A ship which is close-hauled on the port tack shall keep out of the way of a ship which is close-hauled on the starboard tack.

(*c*) When both are running free, with the wind on different sides, the ship which has the wind on the port side shall keep out of the way of the other.

(*d*) When both are running free, with the wind on the same side, the ship which is to windward shall keep out of the way of the ship which is to leeward.

(*e*) A ship which has the wind aft shall keep out of the way of the other ship.

ARTICLE 15.

If two ships under steam are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other.

This article only applies to cases where ships are meeting end on, or nearly end on, in such a manner as to involve risk of collision, and does not apply to two ships which must, if both keep on their respective courses, pass clear of each other.

The only cases to which it does not apply are, when each of the two ships is end on, or nearly end on, to the other; in other words, to cases in which, by day, each ship sees the masts of the other in a line, or nearly in a line, with her own; and, by night, to cases in which each ship is in such a position as to see both the side lights of the other.

It does not apply, by day, to cases in which a ship sees another ahead crossing her own course; or, by night, to cases where the red light of one ship is opposed to the red light of the other, or where the green light of one ship is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.

ARTICLE 16.

If two ships under steam are crossing, so as to involve risk of collision, the ship which has the other on her own starboard side shall keep out of the way of the other.

ARTICLE 17.

If two ships, one of which is a sailing ship and the other steamship, are proceeding

in such directions as to involve risk of collision, the steamship shall keep out of the way of the sailing-ship.

ARTICLE 18.

Every steamship, when approaching another ship, so as to involve risk of collision, shall slacken her speed or stop and reverse if necessary.

ARTICLE 19.

In taking any course authorized or required by these regulations, a steamship under way may indicate that course to any other ship which she has in sight by the following signals on her steam-whistle, viz:

One short blast to mean "I am directing my course to starboard."

Two short blasts to mean "I am directing my course to port."

Three short blasts to mean "I am going full speed astern."

The use of these signals is optional; but if they are used the course of the ship must be in accordance with the signal made.

ARTICLE 20.

Notwithstanding anything contained in any preceding article, every ship, whether a sailing-ship or a steamship, overtaking another, shall keep out of the way of the overtaken ship.

ARTICLE 21.

In narrow channels every steamship shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such ship.

ARTICLE 22.

Where, by the above rules, one of two ships is to keep out of the way, the other shall keep her course.

ARTICLE 23.

In obeying and construing these rules due regard shall be had to all dangers of navigation, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

ARTICLE 24.

No ship, under any circumstances, to neglect proper precautions.

Nothing in these rules shall exonerate any ship, or the owner, or master, or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

ARTICLE 25.

Reservation of rules for harbors and inland navigation.

Nothing in these rules shall interfere with the operation of a special rule, duly made by local authority, relative to the navigation of any harbor, river, or inland navigation.

ARTICLE 26.

Special lights for squadrons and convoys.

Nothing in these rules shall interfere with the operation of any special rules made by the government of any nation with respect to additional station and signal lights for two or more ships of war or for ships sailing under convoy.

Bill H. R. 4430. Forty-sixth Congress, second session.

IN THE HOUSE OF REPRESENTATIVES, FEBRUARY 11, 1880.

Read twice, referred to the Committee on Naval Affairs, and ordered to be printed.

Mr. WHITTHORNE, by unanimous consent, introduced the following bill:

A BILL to provide a commission for the examination of existing and proposed rules for preventing collisions on the water, and for framing such rules as shall be in consonance with and in furtherance of the interests of international law.

Whereas in the year eighteen hundred and sixty-three the Governments of Great Britain and France submitted certain "rules for preventing collisions at sea" to the principal maritime nations of the world for their approval, in order that vessels of all nations might be guided by one universal law on the high seas; and

Whereas before the close of the year eighteen hundred and sixty-five thirty-four of the maritime nations of the world, the United States being amongst the number, had made these rules a part of their municipal laws: and

Whereas by this common action of nearly all the maritime nations of the world, these rules became an integral part of international law, and, as such, subject to change or modification only by the consent of the maritime world; and

Whereas in eighteen hundred and seventy-four the Revised Statutes of the United States were compiled, in which these rules appeared under the caption of section forty-two hundred and thirty-three, modified and altered in intent; and

Whereas the modifications and alterations, not being submitted to or having received the approval of foreign maritime nations, were made in violation of one of the most important principles of international law; and

Whereas, it having become necessary to modify the international rules in order to accommodate the increasing necessities of commerce, the Parliament of Great Britain created a commission in eighteen hundred and seventy-eight, composed of representatives of every branch of the British marine, to examine the rules and frame such amendments to them as might seem necessary; and

Whereas this commission, in obedience to its instructions, did frame a code of modified rules, which the British Government submitted to all the maritime nations of the world for their approval; and

Whereas the majority of the maritime nations of the world have approved of these new rules, the United States being of the number; and

Whereas the approval of the United States Government was given without a proper examination of these rules by competent representatives of the different branches of the marine service; and

Whereas, after the date of this formal approval, a bill proposing certain changes in section forty-two hundred and thirty-three of the Revised Statutes of the United States was submitted to the Senate and House of Representatives of Congress; and

Whereas, if the part of this bill which refers to section forty-two hundred and thirty-three of the Revised Statutes be made statutory, it will not only be in violation of the principles of international law, but it will be a violation of the formal approval of the United States given to the British Government; and

Whereas, not only American commercial interests, but the maritime interests of the whole world imperatively demand that the principles of international law should be properly guarded and advanced; Therefore

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Navy is hereby authorized to name three naval officers as commissioners on the part of the Navy, and the Secretary of the Treasury is authorized to name two members of the Board of Supervising Inspectors as commissioners on the part of the merchant service, and one officer of the revenue marine as a commissioner on the part of the revenue-marine service, and the governor of the State of New York be authorized to name a pilot commissioner as a commissioner on the part of the pilot service.

SEC. 2. That said commissioners shall meet at the earliest convenient period after they shall have been respectively named, and carefully examine all existing or proposed rules for preventing collision on the water.

SEC. 3. That the commissioners shall then proceed to frame a code of rules for preventing collision, for the government of United States vessels on the high seas, which shall be in accord with the present maritime usage, and in furtherance of the interests of international law.

SEC. 4. That this code of rules shall be submitted for the formal approval of the Navy and Treasury Departments, and, after receiving said approvals, it shall be submitted to Congress for legislation.

SEC. 5. That the commissioners shall be empowered to consider such other matters

of international maritime importance as may be submitted to them by the Secretary of the Navy or the Secretary of the Treasury, and to make such recommendations as may seem right and proper with regard to them.

SEC. 6. That the authority given to the commissioners to frame rules shall not extend to any interference with the authority of the Secretary of the Navy or the Board of Supervising Inspectors to make regulations for preventing collisions in rivers or harbors or inland waters at present authorized by law.

SEC. 7. That in the event of a disagreement upon any point in framing the new code, the commissioners shall name as an arbiter a judge of one of the district courts of the United States, whose decision thereon shall be final.

No. 15.

Mr. Hay to Mr. Sherman.

DEPARTMENT OF STATE,
Washington, June 21, 1880.

SIR: Referring to the letter of this Department to you of the 26th of April last, transmitting for your information and consideration copies of an order in council issued by Her Majesty suspending, so far as the British Government is concerned, article 10 of the revised regulations for preventing collisions at sea, until the 1st of September, 1881, I now beg leave to recall the subject to your attention for the purpose of inquiring whether, in your opinion, it will be necessary for this government to adopt any measures in consequence of the above-mentioned action of the British Government. This information is desired by this Department in order that it may be prepared to answer such questions on the subject as may be asked by foreign governments, that of Italy having already made inquiries as to the course which this government intends to pursue in reference to the matter.

In this connection I have the honor, furthermore, to call your attention to the fact that this government has not yet assented to the date, September 1 next, suggested by the British Government for the taking effect of the revised regulations in question, in the printed document which accompanied the letter of this Department to you of the 24th of November last. If no objections exist to the date fixed, as above-mentioned, this Department will take pleasure in notifying the British Government to that effect, and thereupon the proper steps can be taken for proclaiming the ratification of the revised regulations in question.

I have, &c.,

JOHN HAY,
Acting Secretary.

No. 16.

Letter of same tenor and date to the Secretary of the Navy.

No. 17.

Mr. Hay to Sir E. Thornton.

DEPARTMENT OF STATE,
Washington, June 29, 1880.

SIR: Referring to previous correspondence in relation to the revised international regulations for the prevention of collisions at sea, and

particularly to your note of the 8th of October last, proposing the 1st of September next as a suitable date for the taking effect of the revised regulations in question, I now have to inform you that the executive branch of this government does not consider it expedient to take any further action in regard to this matter at present, owing to the fact that the whole subject is now before Congress.

I transmit herewith for your information copies of the bill on the subject now before the House of Representatives, and of the letter of the Secretary of the Navy in relation thereto, Congress having adjourned without completing its consideration of this important matter, any action of the executive branch of this government in regard to it must of necessity be deferred until after the reassembling of the National legislature in December next. Meanwhile this country must be considered as outside of the proposed international regulations until such time as Congress may see fit to take action upon the subject.

I have, &c.,

JOHN HAY,
Acting Secretary.

No. 18.

Mr. Drummond to Mr. Hay.

WASHINGTON, *June* 30, 1880.

SIR: I have the honor to acknowledge the receipt of your note and its inclosures of yesterday's date, addressed to Sir Edward Thornton, in answer to previous correspondence with him, and more particularly to his note of the 8th of October last, proposing the 1st of September next as a suitable date for the taking effect of the revised international regulations for the prevention of collisions at sea.

I will not fail to acquaint Lord Granville with the contents of your note, stating that the United States must be considered as outside of the proposed regulations until Congress completes its consideration thereon, and that, on account of the reasons which you give, the executive branch of the United States Government will be unable to take further action in the matter for the present.

I have, &c.,

VICTOR DRUMMOND.

No. 19.

Commodore Jeffers to Mr. Evarts.

NAVY DEPARTMENT,
Washington, July 1, 1880.

SIR: I have the honor to acknowledge the receipt of your letter of the 21st ultimo, transmitting for my information and consideration copies of an order in council issued by Her Majesty, suspending, so far as the British Government is concerned, article 10 of the revised regulations for preventing collisions at sea, until the 1st of September, 1881.

I inclose a copy of a communication from Commodore W. L. Whiting,

chief of the bureau of navigation, dated June 26, No. 14, and the Department concurs in the views expressed by him on the subject.

Very respectfully,

WILLIAM H. JEFFERS,
Acting Secretary of the Navy.

Commodore Whiting to Mr. Thompson.

No. 14.] BUREAU OF NAVIGATION, NAVY DEPARTMENT,
Washington, June 26, 1880.

SIR: I have the honor to submit herewith the following remarks in regard to the subject-matter of the letters of the honorable Secretary of State of the 21st instant, and of the 26th of April last, which were referred by you to this bureau:

It is respectfully submitted that as far as the article 10 of the regulation referred to is concerned, the question of the postponement of the date of going into effect is a matter resting entirely with the discretion of the Treasury Department; for the reason that the Navy Department exercises no control, except over vessels of the Navy, whilst the article referred to deals exclusively with fishing vessels and open boats, which are subject to the control of the Treasury Department.

With reference to the communication of the State Department, dated November 24, 1879, and referred to in the letter of June 21 instant, it is respectfully submitted that previous to the adjournment of the last session of Congress no answer could be returned to the inquiry of the British Government, for the reason that the regulations referred to had not at that time been submitted to Congress for legislation, and while, as far as the Navy Department was concerned, there was no objection to them, it was necessary to await Congressional action before it could be determined whether a postponement was necessary or not.

In view of the non-consideration of the subject by the legislative branch of the government, the question presents itself as to how the Navy Department should proceed in answering the points submitted to it by the Department of State.

It is respectfully submitted that in case these regulations go into effect on the 1st of September, 1880, by the common consent of the maritime nations of the world, the United States Government being excepted simply on account of no action having been taken, although sufficient time and opportunity were afforded, the honorable Secretary may in his discretion establish these regulations as regulations of the United States Navy, in compliance with the necessities and demands of the common law of the sea, and for the reason that these regulations are intended especially for the guidance of vessels outside of waters that are subject to local or national jurisdiction. They are not municipal law, and as such are not subject to the control of any single government; therefore the effect that their establishment by common consent would have upon the corresponding regulations now recognized as statutory, would be to change the scope of the latter from international to municipal law, valid only in waters within the jurisdiction of the United States.

Whilst the United States Government has the power to impose such laws as it may see fit for the guidance of its vessels, it has no right to extend the jurisdiction of any statutes in contravention with the law of nations, beyond its own territorial waters. It appears to follow from this that the Secretary of the Navy, by the authority granted him to make regulations for the government of the Navy, may order vessels of the Navy to comply with the law of nations when in ex-territorial waters.

This being the case, it is respectfully submitted that the Secretary of the Navy may, in his discretion, answer the question asked by the State Department by stating that as far as the Navy is concerned, no objection exists to the date fixed for the new regulations to take effect (September 1, 1880), and that on that date they will take effect in the United States Navy in the form of naval regulations.

As before stated, the exception made with regard to article 10 is a matter left to the discretion of the Secretary of the Treasury, with whose decision the Secretary of the Navy may concur.

Very respectfully, &c.,

WM. D. WHITING,
Chief of Bureau.

No. 20.

Mr. Hunter to Mr. Thompson.

DEPARTMENT OF STATE,
Washington, July 3, 1880.

SIR: I have the honor to acknowledge the receipt of Mr. Acting Secretary Jeffers's letter of the 1st instant, in reply to Mr. Evarts's letter of the 21st ultimo, transmitting for your information and consideration copies of an order in council, issued by Her Majesty, suspending, so far as the British Government is concerned, article 10 of the revised regulations for preventing collisions at sea, until September 1, 1880. The communication of Commodore Whiting, chief of the bureau of navigation, therewith inclosed, with the expressed concurrence of your Department in its views, has received most careful attention.

Briefly, it takes the ground that as the suspended article 10 relates only to fishing vessels and open boats, with which your Department has no concern, the action of your Department on such suspension is needless, but that with respect to the general code of revised regulations, you may, in your discretion, regard those rules as part of the common law of the high seas, and so prescribe them as regulations for the United States Navy, to be observed on the high seas and outside of any municipal jurisdiction. Hence, it is recommended that they be so promulgated for the guidance of our naval vessels, to take effect on the 1st of September next.

Before proceeding, however, to bring the foregoing to the knowledge of the British and other governments concerned as the conclusion of your Department in the premises, it seems to me proper to acquaint you with the action already had, in view of your letters of the 3d March and 10th of May of this year, and of the conclusions reached in the matter by the Secretary of the Treasury, to whom the several communications of the British representative, which have been brought to your notice, were likewise made known.

In a note to the British chargé d'affaires, dated the 29th ultimo, the Secretary of State informed him that the executive branch of this government did not consider it expedient to take any further action in regard to the revised regulations at present, owing to the fact that the whole subject is now before Congress, and that, as that body has adjourned without completing its consideration of this important matter, any action of the executive in regard to it must of necessity be deferred until after the reassembling of the national legislature in December next, it being necessary in the mean time to regard this country as outside of the proposed international regulations, until such time as Congress may see fit to take action upon the subject. At the same time for the more complete elucidation of the subject, the Department furnished the British legation with copies of your letter of January 22, addressed to Speaker Randall (House Ex. Doc. No. 55), and of House bill No. 4430 therein referred to.

It will, however, be readily seen that the action thus taken has reference to the need of legislation to change existing municipal law within the territorial jurisdiction of the United States, and does not necessarily prejudice the decision of your Department (as announced in Mr. Jeffers's letter of the 1st instant) to put the revised rules of the road into effect as a naval regulation, on the vessels of the United States on the high seas, on and after the 1st of September next.

If, therefore, you are still of the same opinion, I beg that you will let me know as soon as may be practicable, in order that this Department may lose no time in communicating your action to the British Government, with which the revised regulations originated, and also to the other governments which have adopted the same.

I have, &c.,

W. HUNTER,
Acting Secretary.

No. 21.

Commodore Jeffers to Mr. Evarts.

NAVY DEPARTMENT,
Washington, August 23, 1880.

SIR: I have the honor to acknowledge the receipt of a communication from the Department of State, dated July 3, 1880, referring to the proposed action of the Navy Department with regard to the "revised regulations for preventing collisions at sea," and asking if the Secretary of the Navy is still of the opinion expressed in a previous communication to the State Department dated July 1 ultimo.

In reply I have the honor to state that the Navy Department is of the opinion that the issue of a general order making it obligatory for all United States naval vessels to navigate the high seas in conformity with the law of the sea is a proceeding fully within the authority of the Secretary of the Navy, and that it is necessary to issue such an order for the protection of commerce.

It is a part of the duty of the Secretary of the Navy to keep the commanders of naval vessels informed of all changes in navigation laws that bear upon the conduct of men-of-war and the enforcement of new international regulations.

I have, therefore, the honor to inform you that a general order has been issued (a copy of which is herewith inclosed) making it obligatory for all United States naval vessels to navigate the high seas in conformity with the "revised international regulations" after September 1, 1880. At the same time all commanding officers are notified that in waters within the jurisdiction of the United States they will navigate in accordance with the prescriptions of the United States Revised Statutes.

I have, &c.,

WILLIAM H. JEFFERS,
Acting Secretary of the Navy.

[General Order No. 253.]

REGULATIONS FOR PREVENTING COLLISIONS AT SEA.

NAVY DEPARTMENT,
Washington, D. C., July 16, 1880.

A revised code of "regulations for preventing collisions at sea" having been approved by nearly all the maritime nations of the world, and adopted by them, to go into effect on the 1st September, 1880, thus becoming an integral part of the law of the sea, it is hereby adopted for the naval service of the United States, to go into effect on the

above mentioned date, *in so far as the navigation of naval vessels outside of United States territorial waters is concerned.* Within the waters of the United States, naval vessels will be guided by the regulations for preventing collisions as specified in section 4233 of the United States Revised Statutes.

Navy Department General Order No. 34, dated May 4, 1864, and forming Appendix No. 2 of the United States Naval Regulations, is hereby rescinded; and the precepts of the revised regulations and of the United States statutes hereto appended will be strictly complied with in accordance with the above specifications.

A careful examination and comparison of the appended codes is enjoined upon all officers of the Navy, especially of those parts of the revised regulations which are printed in italics, as it is in them that the modifications from the old rules exist.

WM. N. JEFFERS,
Acting Secretary of the Navy.

Section 4233, U. S. Revised Statutes.

RULE I. Every steam-vessel which is under sail, and not under steam, shall be considered a sail-vessel; and every steam-vessel which is under steam, whether under sail or not, shall be considered a steam-vessel.

RULE II. The lights mentioned in the following rules, and no others, shall be carried in all weathers, between sunset and sunrise.

RULE III. All ocean-going steamers, and steamers carrying sail, shall, when under way, carry—

(*A.*) At the foremast-head, a bright white light, of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least five miles, and so constructed as to show a uniform and unbroken light over an arc of the horizon of twenty points of the compass, and so fixed as to throw the light ten points on each side of the vessel, namely, from right ahead to two points abaft the beam on either side.

(*B.*) On the starboard side, a green light, of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles, and so constructed as to show a uniform and unbroken light over an arc of the horizon of ten points of the compass, and so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side.

(*C.*) On the port side, a red light, of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles, and so constructed as to show a uniform and unbroken light over an arc of the horizon of ten points of the compass, and so fixed as to throw the light from right ahead to two points abaft the beam on the port side.

The green and red lights shall be fitted with inboard screens, projecting at least three feet forward from the lights, so as to prevent them from being seen across the bow.

RULE IV. Steam-vessels, when towing other vessels, shall carry two bright white mast-head lights vertically, in addition to their side lights, so as to distinguish them

Revised International Regulations.

ARTICLE I. In the following rules every steamship which is under sail and not under steam is to be considered a sailing-ship; and every steamship which is under steam, whether under sail or not, is to be considered *a ship under steam.*

ARTICLE II. The lights mentioned in the following articles, numbered 3, 4, 5, 6, 7, 8, 9, 10, and 11, and no others, shall be carried in all weathers from sunset to sunrise.

ARTICLE III. A sea-going steamship when under way, shall carry—

(a.) On or in front of the foremast, at a height above the hull of not less than 20 *feet, and if the breadth of the ship exceeds* 20 *feet, then at a height above the hull not less than such breadth,* a bright white light, so constructed as to show an uniform and unbroken light over an arc of the horizon of twenty points of the compass, so fixed as to throw the light ten points on each side of the ship, viz, from right ahead to two points abaft the beam on either side, and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least five miles.

(*b.*) On the starboard side, a green light so constructed as to show an uniforn and unbroken light over an arc of the horizon of ten points of the compass; so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side; and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(*c.*) On the port side, a red light so constructed as to show an uniform and unbroken light over an arc of the horizon of ten points of the compass; so fixed as to throw the light from right ahead to two points abaft the beam on the port side; and of such a character as to be visible on a dark night, with a clear atmosphere, at a distance of at least two miles.

(*d.*) The said green and red side lights shall be fitted with inboard screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

ARTICLE IV. A steamship, when towing another ship, shall, in addition to her side lights, carry two bright white lights in a vertical line one over the other, *not less than*

from other steam-vessels. Each of these mast-head lights shall be of the same character and construction as the mast-head lights prescribed by Rule three.

RULE V. All steam-vessels other than ocean-going steamers and steamers carrying sail, shall, when under way, carry on the starboard and port sides lights of the same character and construction and in the same position as are prescribed for side lights by Rule three, except in the case provided in Rule six.

(New regulation.)

RULE VI. River-steamers navigating waters flowing into the Gulf of Mexico and their tributaries, shall carry the following lights, namely: One red light on the outboard side of the port smoke-pipe, and one green light on the outboard side of the starboard smoke-pipe. Such lights shall show both forward and abeam on their respective sides.

RULE VII. All coasting steam-vessels, and steam-vessels other than ferry-boats and vessels otherwise expressly provided for, navigating the bays, lakes, rivers, or other inland waters of the United States, except those mentioned in Rule six, shall carry the red and green lights, as prescribed for ocean-going steamers; and, in addition thereto, a central range of two white lights; the after light being carried at an elevation of at least fifteen feet above the light at the head of the vessel. The head-light shall be so constructed as to show a good light through twenty points of the compass, namely: From right ahead to two points abaft the beam on either side of the vessel; and the after light so as to show all around the horizon. The lights for ferry-boats shall be regulated by such rules as the Board of Supervising Inspectors of Steam-vessels shall prescribe.

RULE VIII. Sail-vessels, under way or being towed, shall carry the same lights as steam-vessels under way, with the exception of the mast-head lights, which shall not be required.

three feet apart, so as to distinguish her from other steamships. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light which other steamships are required to carry.

(Inland Water Regulation.)

ARTICLE V. *A ship, whether a steamship or sailing-ship, when employed either in laying or picking up a telegraph cable, or which, from any accident, is not under command, shall at night carry, in the same position as the white light which steamships are required to carry; and if a steamship, in place of that light, three red lights in globular lanterns, each not less than ten inches in diameter, in a vertical line one over the other, not less than three feet apart, and shall by day carry in a vertical line one over the other, not less than three feet apart, in front of but not lower than her foremast head, three black balls or shapes, each two feet in diameter.*

These shapes and lights are to be taken by approaching ships as signals that the ship using them is not under command, and cannot therefore get out of the way.

The above ships, when not making any way through the water, shall not carry the side lights, but when making way shall carry them.

(Inland water regulation not affecting naval vessels.)

ARTICLE VI. A sailing-ship under way, or being towed, shall carry the same lights as are provided by article 3 for a

ception of the white mast-head lights, which they shall never carry.

RULE IX. Whenever, as in case of small vessels during bad weather, the green and red lights cannot be fixed, these lights shall be kept on deck, on their respective sides of the vessel, ready for instant exhibition, and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side, nor the red light on the starboard side. To make the use of these portable lights more certain and easy, they shall each be painted outside with the color of the light they respectively contain, and shall be provided with suitable screens.

RULE X. All vessels, whether steam-vessels or sail-vessels, when at anchor in roadsteads or fairways, shall, between sunset and sunrise, exhibit where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light in a globular lantern of eight inches in diameter, and so constructed as to show a clear, uniform, and unbroken light, visible all around the horizon, and at a distance of at least one mile.

RULE XI. Sailing pilot-vessels shall not carry the lights required for other sailing-vessels, but shall carry a white light at the mast-head, visible all around the horizon, and shall also exhibit a flare-up light every fifteen minutes.

(New regulation.)

RULE XII. Coal-boats, trading-boats, produce-boats, canal-boats, oyster-boats, fishing-boats, rafts, or other water craft, navigating any bay, harbor, or river, by hand-power, horse-power, sail, or by the current of the river, or which shall be anchored or moored in or near the channel or fairway, of any bay, harbor, or river, shall carry one or more good white lights, which shall be placed in such manner as shall be prescribed by the Board of Supervising Inspectors of Steam-vessels.

RULE XIII. Open boats shall not be required to carry the side lights required for other vessels, but shall, if they do not carry such lights, carry a lantern having a green slide on one side and a red slide on the other side; and, on the approach of or to other vessels, such lantern shall be exhibited in sufficient time to prevent collision, and in such a manner that the green light shall not be seen on the port side, nor the red light on the starboard side. Open boats, when at anchor or stationary, shall exhibit a bright white light. They

steamship under way, with the exception of the white light, which she shall never carry.

ARTICLE VII. Whenever, as in the case of small vessels, during bad weather, the green and red side lights cannot be fixed, these lights shall be kept on deck, on their respective sides of the vessel, ready for use, and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side.

To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

ARTICLE VIII. A ship, whether a steamship or a sailing-ship, *when at anchor*, shall carry, where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light in a globular lantern of not less than eight inches in diameter, and so constructed as to show a clear, uniform, and unbroken light, visible all round the horizon, at a distance of at least one mile.

ARTICLE IX. A pilot-vessel, *when engaged on her station on pilotage duty*, shall not carry the lights required for other vessels, but shall carry a white light at the mast-head, visible all round the horizon, and shall also exhibit a flare-up light, *or flare-up lights, at short intervals, which shall never exceed fifteen minutes.*

A pilot-vessel, when not engaged on her station on pilotage duty, shall carry lights similar to those of other ships.

(Inland water regulation not affecting naval vessels.)

ARTICLE X. (*a.*) Open fishing-boats and other open boats, when under way, shall not be obliged to carry the side lights required for other vessels, but every such boat shall, in lieu thereof, have ready at hand a lantern with a green glass on the one side and a red glass on the other side, and on the approach of or to other vessels, such lantern shall be exhibited, in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

(*b.*) A fishing-vessel and an open boat,

shall not, however, be prevented from using a flare-up, in addition, if considered expedient.

when at anchor, shall exhibit a bright white light.

(*c.*) *A fishing-vessel, when employed in drift-net fishing, shall carry on one of her masts two red lights in a vertical line one over the other, not less than three feet apart.*

(*d.*) *A trawler at work shall carry on one of her masts two lights in a vertical line one over the other, not less than three feet apart, the upper light red and the lower green, and shall also either carry the side lights required for other vessels, or, if the side lights cannot be carried, have ready at hand the colored lights, as provided in article 7, or a lantern with a red and a green glass, as described in paragraph (a) of this article.*

(*e.*) Fishing-vessels and open boats shall not be prevented from using a flare-up in addition, if they desire to do so.

(*f.*) *The lights mentioned in this article are substituted for those mentioned in the 12th 13th, and 14th articles of the convention between France and England scheduled to the British Sea Fisheries Act*, 1868.

(*g.*) *All lights required by this article, except side lights, shall be in globular lanterns so constructed as to show all round the horizon.*

(New regulations.)

(Rescinded.)

RULE XIV. The exhibition of any light on board of a vessel of war of the United States may be suspended whenever, in the opinion of the Secretary of the Navy, the commander-in-chief of a squadron, or the commander of a vessel acting singly, the special character of the service may require it.

RULE XV. Whenever there is a fog, or thick weather, whether by day or night, fog-signals shall be used as follows:

ARTICLE XII. *A steamship shall be provided with a steam-whistle, or other efficient steam-sound signal, so placed that the sound may not be intercepted by any obstructions, and with an efficient fog-horn to be sounded by a bellows or other mechanical means, and also with an efficient bell. A sailing-ship shall be provided with a similar fog-horn and bell.*

In fog, mist, or falling snow, whether by day or night, the signals described in this article shall be used as follows, that is to say:

(*A.*) Steam-vessels under way shall sound a steam-whistle placed before the funnel, not less than eight feet from the deck, at intervals of not more than one minute.

(*a.*) A steamship under way shall make with her steam-whistle, or other steam-sound signal, at intervals of not more than *two* minutes, a prolonged blast.

(*B.*) Sail-vessels under way shall sound a fog-horn at intervals of not more than five minutes.

(*b.*) A sailing-ship under way shall make with her fog-horn, at intervals of not more than *two* minutes, *when on the starboard tack one blast, when on the port tack two blasts in succession, and when with the wind abaft the beam three blasts in succession.*

(New regulation.)

(*C.*) Steam-vessels and sail-vessels, when not under way, shall sound a bell at intervals of not more than five minutes.

(*c.*) A steamship and sailing-ship, when not under way, shall, at intervals of not more than *two* minutes, ring the bell.

(*D.*) Coal-boats, trading-boats, produce-boats, canal-boats, oyster-boats, fishing-boats, rafts, or other water craft, navigating any bay, harbor, or river, by hand-power, horse-power, sail, or by the current of the river, or anchored or moored in or near the channel or fair way of any bay, harbor or river, and not in any port, shall sound a fog-horn, or equivalent signal,

(Inland water regulation not affecting naval vessels.)

which shall make a sound equal to a steam-whistle, at intervals of not more than two minutes.

(See Rule XXI.)

RULE XVI. If two sail-vessels are meeting end on, or nearly end on, so as to involve risk of collision, the helms of both shall be put to port, so that each may pass on the port side of the other.

RULE XVII. When two sail-vessels are crossing so as to involve risk of collision, then, if they have the wind on different sides, the vessel with the wind on the port side shall keep out of the way of the vessel with the wind on the starboard side, except in the case in which the vessel with the wind on the port side is close-hauled, and the other vessel free, in which case the latter vessel shall keep out of the way. But if they have the wind on the same side, or if one of them has the wind aft, the vessel which is to windward shall keep out of the way of the vessel which is to leeward.

RULE XVIII. If two vessels under steam are meeting end on, or nearly end on, so as to involve risk of collision, the helms on both shall be put to port, so that each may pass on the port side of the other.

(Explanatory note.)

RULE XIX. If two vessels under steam are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

RULE XX. If two vessels, one of which is a sail-vessel and the other a steam-vessel, are proceeding in such directions as to involve risk of collision, the steam-vessel

ARTICLE XIII. Every *ship, whether sailing-ship or* steamship, shall, in a fog, mist, or falling snow, go at a moderate speed.

ARTICLE XIV. When two sailing-ships are approaching one another so as to involve risk of collision, one of them shall keep out of the way of the other, as follows, viz:

(*a.*) A ship which is running free shall keep out of the way of a ship which is close-hauled.

(*b.*) A ship which is close-hauled on the port tack shall keep out of the way of a ship which is close-hauled on the starboard tack.

(*c.*) When both are running free with the wind on different sides, the ship which has the wind on the port side shall keep out of the way of the other.

(*d.*) When both are running free with the wind on the same side, the ship which is to windward shall keep out of the way of the ship which is to leeward.

(*e.*) A ship which has the wind aft shall keep out of the way of the other ship.

ARTICLE XV. If two ships under steam are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other.

This article only applies to cases where ships are meeting end on, or nearly end on, in such a manner as to involve risk of collision, and does not apply to two ships which must, if both keep on their respective courses, pass clear of each other.

The only cases to which it does apply are, when each of the two ships is end on, or nearly end on, to the other; in other words, to cases in which, by day, each ship sees the masts of the other in a line, or nearly in a line, with her own; and, by night, to cases in which each ship is in such a position as to see both the side lights of the other.

It does not apply, by day, to cases in which a ship sees another ahead crossing her own course, or, by night, to cases where the red light of one ship is opposed to the red light of the other, or where the green light of one ship is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.

ARTICLE XVI. If two ships under steam are crossing so as to involve risk of collision, the ship which has the other on her own starboard side shall keep out of the way of the other.

ARTICLE XVII. If two ships, one of which is a sailing-ship, and the other a steamship, are proceeding in such directions as to involve risk of collision, the steamship

shall keep out of the way of the sail-vessel.

RULE XXI. Every steam-vessel, when approaching another vessel, so as to involve risk of collision, shall slacken her speed, or, if necessary, stop and reverse; and every steam-vessel shall, when in a fog, go at a moderate speed.

(Article XIX is an obligatory regulation in United States, waters, although not mentioned in the Statutes.)

RULE XXII. Every vessel overtaking any other vessel shall keep out of the way the last-mentioned vessel.

(New regulation.)

RULE XXIII. Where, by rules seventeen, nineteen, twenty, and twenty-two, one of two vessels shall keep out of the way, the other shall keep her course, subject to the qualifications of rule twenty-four.

RULE XXIV. In construing and obeying these rules, due regard must be had to all dangers of navigation, and to any special circumstances which may exist in any particular case rendering a departure from them necessary in order to avoid immediate danger.

SECTION 4234. * * * and every such vessel (sail-vessel) shall, on the approach of any steam-vessel during the night-time, show a lighted torch upon that point or quarter to which such steam-vessel shall be approaching. * * *

(New regulations.)

shall keep out of the way of the sailing ship.

ARTICLE XVIII. Every steamship, when approaching another ship so as to involve risk of collision, shall slacken her speed or stop and reverse if necessary.

ARTICLE XIX. *In taking any course authorized or required by these regulations, a steamship under way may indicate that course to any other ship which she has in sight by the following signals on her steam-whistle, viz:*

One short blast to mean "I am directing my course to starboard." Two short blasts to mean "I am directing my course to port." Three short blasts to mean "I am going at full speed astern."

The use of these signals is optional; but if they are used the course of the ship must be in accordance with signals made.

ARTICLE XX. *Notwithstanding anything contained in any preceding article*, every ship, whether a sailing-ship or a steamship, overtaking another, shall keep out of the way of the overtaken ship.

ARTICLE XXI. *In narrow channels every steamship shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such ship.*

ARTICLE XXII. Where, by the above rules, one of two ships is to keep out of the way, *the other shall keep her course.*

ARTICLE XXIII. In obeying and construing these rules, due regard shall be had to all dangers of navigation, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

ARTICLE XI. A ship which is being overtaken by another shall show from her stern to such last-mentioned ship *a white light or a flare-up light.*

ARTICLE XXIV. *Nothing in these rules shall exonerate any ship, or the owner, or master, or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.*

ARTICLE XXV. *Nothing in these rules shall interfere with the operation of a special rule, duly made by local authority, relative to the navigation of any harbor, river, or inland navigation.*

ARTICLE XXVI. *Nothing in these rules shall interfere with the operation of any special rules made by the government of any nation with respect to additional station and signal lights for two or more ships of war, or for ships sailing under convoy.*

NOTE.—Paragraphs (*c*), (*d*), (*e*), (*f*), and (*g*) of Article X are suspended until September 1, 1881, in order to permit a knowledge of them to be circulated among all vessels which they affect.

No. 22.

Mr. Drummond to Mr. Evarts.

WINDSOR, VT., *August* 24, 1880.

SIR: In accordance with instructions received from Earl Granville, I have the honor to inform you that the board of trade have pointed out to his lordship that the course proposed to be adopted by the United States Government, as mentioned in your note addressed to me on the 27th of June last, in respect to the new regulations for preventing collisions at sea, may and probably will lead to difficulties between United States ships and British ships after the date fixed for bringing the new rules into operation. At present, according to English law, if the case were brought into a British court, it would be decided according to the new rules. But if the order in council has to be altered, and the name of the United States as agreeing to the new rules is to be omitted, there will be no rules by which the case can be governed, as the old rules will be at an end. Similar inconveniences will probably arise in the United States.

I have therefore been instructed by Earl Granville to transmit the inclosed copy of the order in council* for the information of the Government of the United States, and to express a hope that they may be disposed to carry out the new rules until and unless the Government of the United States after Congress meets should think that the new rules require alteration. In that case, any points they may then raise can be carefully considered and submitted to the various powers. This course would avoid inconvenience and would not pledge the United States as to the future, since they could withdraw at any time.

In submitting the above to the favorable consideration of the United States Government, I have the honor to request that I may be favored with the views they may be pleased to take thereupon at as early an opportunity as possible.

I have, &c.,

VICTOR DRUMMOND.

No. 23.

Mr. Hay to Mr. Thompson.

DEPARTMENT OF STATE,
Washington, August 26, 1880.

SIR: I have the honor to acknowledge the receipt of Mr. Acting Secretary Jeffers's letter of the 23d instant, referring to previous correspondence with regard to the "revised regulations for preventing collisions at sea," and inclosing a copy of a general order issued by your department, making it obligatory for all United States naval vessels to navigate the high seas in conformity with the "revised international regulations" after September 1, 1880.

In reply I have to say that the above-mentioned letter of Acting Secretary Jeffers shall have the consideration of this Department. Meanwhile I beg you to do me the favor of sending hither for the use of this Department a few additional copies of the order above mentioned.

I have, &c.,

JOHN HAY.

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*For this order in council see inclosure in letter of Secretary of the Navy, May 10, 1880.

No. 24.

Mr. Hay to Mr. Sherman.

DEPARTMENT OF STATE,
Washington, August 27, 1880.

SIR: Referring to the letter of this Department to you of the 24th of November last, in relation to the international regulations for the prevention of collisions at sea; and, referring also to the subsequent correspondence on the same subject, I now have the honor to inclose herewith for your information and consideration a copy of a note dated the 24th instant from Mr. Victor Drummond, chargé d'affaires *ad interim* of Her Britannic Majesty at this capital, in which, by order of his government, he calls the attention of this Department to certain inconveniences which it is feared may result from the non-adoption of the international regulations in question by the United States.

In view of the difficulties to which Mr. Drummond's note refers I beg to inquire whether your Department would consider it practicable to temporarily authorize the merchant marine of the United States to observe the international regulations by an executive order. If this should not be thought to be advisable, I would then suggest whether a simple notice might not be given that the use of the international regulations by American vessels will not be prevented by the authorities of the United States.

I have, &c.,

JOHN HAY,
Acting Secretary.

No. 25.

Mr. French to Mr. Hay.

TREASURY DEPARTMENT,
September 2, 1880.

SIR: I have the honor to acknowledge the receipt of your communication of the 27th ultimo in relation to the international regulations for the prevention of collisions at sea, inclosing for the consideration of the department a copy of a note of the 24th ultimo from Mr. Victor Drummond, charge d'affaires *ad interim* of Her Britannic Majesty at this capital, in which attention is called to certain inconveniences which it is feared may result from the non-adoption of the international regulations by the United States.

You inquire whether, in view of the difficulties to which Mr. Drummond's note refers, this department would consider it practicable to temporarily authorize the merchant marine of the United States to observe the international regulations by an executive order, or whether, at least, a simple notice may not be given that use of these regulations by American vessels will not be prevented by the authorities of the United States.

This department has carefully considered the subject of your communication and has come to the conclusion that it has no power to formally authorize the adoption by the commercial marine of the United States of the new international rules of the road for preventing collis-

ions at sea, so long as the provisions of section 4233 of the Revised Statutes remain unchanged by the action of Congress.

This department has, however, given notice to the press of the embarrassments to which American vessels will be liable in cases of collision with vessels of other nationalities by not conforming to the need regulations, and has suggested that a compliance by vessels of the United States with these regulations while navigating foreign waters will not entail any penalties upon them on their return to this country.

Before taking any further step in recognition of the new regulations this department is disposed to await the action of Congress.

Very respectfully,

H. F. FRENCH,
Acting Secretary.

No. 26.

Mr. Blaine to Mr. Windom.

DEPARTMENT OF STATE,
Washington, April 18, 1881.

SIR: I have the honor to transmit herewith, for the use of your department, two copies of an order in council, dated the 27th of November, 1880, which has been promulgated by Her Majesty's Government, setting forth certain modifications which have been made in the international regulations for preventing collisions at sea.

I have, &c.,

JAMES G. BLAINE.

No. 27.

Letter of same tenor and date to the Secretary of the Navy.

No. 28.

Mr. Hunt to Mr. Blaine.

NAVY DEPARTMENT,
Washington, April 19, 1881.

SIR: Relative to the subject-matter of your communication of the 5th instant I beg leave to say that the misprint in the circular issued from the State Department on October 5 last (page 5, Article XV, first line, third clause, where the word "not" is erroneously inserted) is deemed of a serious nature, and should receive an official correction.

By reference to page 9 of the same circular, quoting the same article as given in the Navy Department General Order No. 253, it will be noticed that the reading is correct, the word "not" being omitted.

I have, &c.,

WILLIAM H. HUNT,
Secretary of the Navy.

No. 29.

Mr. Windom to Mr. Blaine.

TREASURY DEPARTMENT,
April 21, 1881.

SIR: I have the honor to acknowledge the receipt of your letter of the 18th instant inclosing two copies of an order in council of the 27th of November, 1880, which has been promulgated by the British Government, setting forth the modifications which have been made in the international regulations for preventing collisions at sea.

In view of the fact that the international regulations referred to in the order in council have not received the sanction of the Congress of the United States, I would suggest that the proper steps be taken to secure Congressional action in the matter at the earliest opportunity at the next session.

Very respectfully,

WILLIAM WINDOM,
Secretary.

No. 30.

Mr. Blaine to Mr. Hunt.

DEPARTMENT OF STATE,
Washington, April 22, 1881.

SIR: I have the honor to acknowledge the receipt of your letter of the 19th instant with respect to the circular of the Department of the 5th October last, containing the "regulations for preventing collisions at sea," addressed to the consular officers of the government at maritime ports, and to inform you that the error of the word "not" in the third line of the explanations under article 15, page 5 thereof, appears to have originated in H. Ex. Doc. No. 55, Forty-sixth Congress, second session, and was thus perpetuated in the circular adverted to.

With a view to the correction of that error, and also in consideration of the fact that other countries not mentioned in that circular have adopted the regulations, it is deemed proper to issue a supplementary circular upon the subject.

I have, therefore, the honor to submit to your consideration herewith a draft of the proposed circular, which embraces the names of the additional countries that have accepted the regulations, and the particular conditions under which Japan and Turkey enter upon the agreement. This renewal of the circular seems to cover the ground presented in the order in council of Her Britannic Majesty under date of the 27th of November, 1880, copies of which were communicated to you in the letter of this Department of the 18th instant.

I will thank you for an expression of your views upon the subject and for any suggestions that you may deem proper to make with the object of making the circular now proposed as correct as the gravity of the matter seems to demand. I should be gratified to receive your approval of the circular without amendments should its provisions meet with the views of your Department, and also to be informed if the regulations "as printed in the Executive Document No. 55, which accom-

panied the letter of the Secretary of the Navy to the House of Representatives of the 22d January, 1880, is in all other respects correct.

I have, &c.,

JAMES G. BLAINE.

No. 31.

Sir Edward Thornton to Mr. Blaine.

WASHINGTON, *April* 30, 1881.

SIR: In compliance with an instruction which I have received from Earl Granville, and with reference to previous correspondence respecting the adoption by the various maritime states of international regulations for the prevention of collisions at sea, and more particularly to my note to Mr. Evarts of the 23d of April, 1880, announcing the suspension of Article X of the regulations until September 1, 1881, I have now the honor to transmit to you copies of a letter from the board of trade, inclosing a new article which it is proposed to substitute for the suspended Article X.

Her Majesty's Government are desirous of ascertaining the opinion of the Government of the United States on the general question of lights for fishing-vessels, and particularly on the question whether the distinguishing light of a trawler at work should be a single white light, or a red light at the mast-head with a subsidiary white light shown aft, anywhere above the gunwale.

I have, &c.,

EDW'D THORNTON.

LIGHTS FOR FISHING VESSELS.

Return to an order of the honorable the House of Commons, dated February 11, 1881, for copy "of report of the committee appointed by the admiralty, the board of trade, and the Trinity House, to consider the regulations for preventing collisions at sea, upon the recommendations contained in the Report of the select committee of the House of Commons on lights for fishing vessels (Parliamentary Paper, No. 285, session 2, 1880)."

T. H. FARRER.

BOARD OF TRADE, *February* 11, 1881.

REPORT.

In pursuance of the recommendations contained in the report of the select committee of the House of Commons on the lights for fishing vessels (Parliamentary Paper 285, session 2, 1880), the admiralty, the board of trade, and the Trinity House reappointed the committee to which had been referred the international steering and sailing rules for preventing collisions at sea, in order that they might reconsider article 10 of the recent regulations relating to fishing vessels.

The committee met at the board of trade on the 5th January, 1881, and there were present Admiral Sir Richard Collinson, R. N., Captain Sir George Nares, R. N., Captain Evans, R. N., Captains Murray and Weller, Mr. H. C. Rothery, Mr. T. H. Farrer, and Mr. T. Gray.

The following are the recommendations to which the committee agreed, viz:

"1. That all fishing vessels, when not actually fishing and attached to their nets, trawls, or lines should be required to carry and show the same lights as other vessels under similar circumstances.

"2. That a drift-net fishing vessel when fishing and attached to her nets should

carry two white lights to show not less than three miles, to be visible all round the horizon, to be six feet in vertical height one above the other, but not necessarily one immediately over the other.

"3. That a trawling vessel when at work should carry two lights, both to show two miles all round the horizon—the red light to be at the mast-head forward of and at least six feet in vertical height above the white light.

"4. That a trawling vessel with her gear fast shall show the same light as a vessel at anchor.

"5. That a decked fishing vessel not exceeding 20 tons shall carry the same lights as open fishing and other boats.'"

It will be observed that these recommendations agree with those of the select committee, except in the case of trawlers, in which case the select committee recommend a single white light.

The departmental committee are of opinion that a single white light is objectionable for various reasons. Considering the number of trawling vessels at work on different parts of the coast, a single white light might often be mistaken either for an anchor light or for a steamer's mast-head light when the side lights were not visible, and might in some cases lead to confusion in the case of shore lights. Further, it is the same as the light now used by pilot vessels. The departmental committee observe that the select committee of the House of Commons felt the difficulty arising from this last objection for they proposed that pilot vessels should be distinguished by adding another colored light in their case. The departmental committee are of opinion that any such alteration, however desirable it might be in the interest of fishing-vessels, is much to be deprecated for the still more important interests of the mercantile marine.

The present pilot lights are matters of world-wide practice and notoriety, and to alter them for the sake of the trawlers would lead to great inconvenience and even danger not only on our own coasts, but in other parts of the world. It is obviously of extreme importance that a merchant vessel on approaching land should know at once how to look for and distinguish a pilot, and it would be long before the masters of merchant ships, who are accustomed to the present distinguishing light, would learn the new distinction. It is, moreover, very doubtful whether foreign nations could be induced to agree to so important and dangerous a change. The only objection which the departmental committee can see to the recommendation which they have made is to be found in the additional expense which the trawlers would have to incur in providing a red light; but they believe that this may be met without the expense of an additional light by some adaptation whereby the one red light used as a mast-head light may also be used as the red side light, which all trawlers must now be provided with.

The following is the article in the shape which the committee recommend for adoption:

"ART. 10. (*a.*) All fishing-vessels and fishing-boats of 20 tons net registered tonnage, or upwards, when under way and when not having their nets, trawls, or lines in the water, shall carry and show the same lights as other vessels under way.

"(*b.*) Open boats and fishing-vessels of less than 20 tons net registered tonnage, when under way, and when not having their nets, trawls, or lines in the water, shall not be obliged to carry the colored side-lights; but every such boat and vessel shall in lieu thereof have ready at hand a lantern with a green glass on the one side and a red glass on the other side, and on approaching to or being approached by another vessel such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side, nor the red light on the starboard side.

"(*c.*) A vessel or boat employed in drift-net fishing, when drifting with her nets, shall not show the colored side lights; but in lieu thereof shall carry two white lights in lanterns so constructed that the lights will show all round the horizon, and be visible on a dark night with a clear atmosphere at a distance of not less than three statute miles; and these lights shall be exhibited where they can best be seen, and so that one of them is at least six feet higher than, but not necessarily immediately over, the other.

"(*d.*) A trawling vessel at work and attached to her trawl shall not show the colored side lights, but shall carry a red light over a white light, both lights in lanterns so constructed that the lights will show all round the horizon, and be visible on a dark night, in a clear atmosphere, at a distance of not less than two statute miles. The red light shall be not less than six feet higher than the white light; it shall be exhibited at the foremast head, or in any other position on or in front of the foremast where it can best be seen; and the white light shall be exhibited in any position in the after part of the vessel where it can best be seen.

"(*e.*) If a trawling vessel at work becomes stationary in consequence of her gear getting fast to a rock or other obstruction, she shall show the light required to be shown by a vessel at anchor.

"(*f.*) Fishing-vessels and open boats may at any time use a flare-up in addition to the lights which they are by this article required to carry and show.

"(*g.*) Every fishing-vessel and every open boat when at anchor between sunset and sunrise shall exhibit a white light visible all round the horizon at a distance of at least one statute mile.

R. COLLINSON,
FREDK. JNO. EVANS.
T. H. FARRER.
THOMAS GRAY.
DIGBY MURRAY.
G. S. NARES.
H. C. ROTHERY.
CHAS. G. WELLER.

LIGHTS FOR FISHING-VESSELS.

Return to an order of the honorable the House of Commons, dated April 25, 1881, for copy "of a further report of the committee appointed by the Admiralty, the Board of Trade, and the Trinity House, to consider the regulations for preventing collisions at sea, upon the recommendation contained in the report of the select committee of the House of Commons on lights for fishing-vessels (Parliamentary paper, No. 285, session 2, 1880); together with copies of letters addressed by the Board of Trade to the foreign office and to ship-owners and others with reference thereto (in continuation of Parliamentary paper, No. 78, of session 1881)."

T. H. FARRER.

BOARD OF TRADE, *April* 25, 1881.

No. 1.

FURTHER REPORT.

BOARD OF TRADE, *April*, 1881.

In pursuance of the recommendations contained in the report of the select committee of the House of Commons on the lights for fishing-vessels (Parliamentary paper 285, session 2, 1880), the Admiralty, the Board of Trade, and the Trinity House reappointed the joint committee to which had been referred the international steering and sailing rules for preventing collisions at sea, in order that they might reconsider article 10 of the recent regulations relating to fishing-vessels.

The committee met at the Board of Trade on the 5th January, 1881, and there were present, Admiral Sir Richard Collinson, R. N., Captain Sir George Nares, R. N., Captain Evans, R. N., Captains Murray and Weller, Mr. H. C. Rothery, Mr. T. H. Farrer, and Mr. T. Gray.

The committee then made a report, which is contained in Parliamentary paper, No. 78, session 1881.

In consequence of further complaints from the trawlers, and of questions in the House of Commons, the joint committee met again on the 30th March, 1881.*

Various letters were read from the owners of steamers and other persons.

The committee reconsidered the question of trawlers' lights, with an anxious desire to meet the views of the owners of this class of vessels, and the recommendation of the select committee. They felt compelled, however, to come to the following conclusions:

That it is most unadvisable to change the distinguishing lights of pilot vessels.

That it would neither be satisfactory nor workable to allow trawling vessels when at work to carry one description of light in one part of the sea, *e. g.*, when on the Dogger Bank, and another description of light when in shore or within pilotage waters.

That the distinguishing light for a trawling vessel must not be a single white light.

That the light for a trawling vessel at work should be a red light at or near the mast-head.

That a trawling vessel at work ought in addition to have a single white light, such as its anchor light, to be carried in the after part of the vessel anywhere above the gunwale.

The following is the rule for trawlers, as they now recommend it:

"(*d.*) A trawling vessel at work, and attached to her trawl, shall not show the col-

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* The Hon. Evelyn Ashley, M. P., was also present.

ored side lights, but shall carry at the foremast head, or in any other position on or in front of the foremast where it can best be seen, a red light in a lantern so constructed that the light will show all round the horizon, and be visible on a dark night, in a clear atmosphere, at a distance of not less than two statute miles. She shall also carry a white light so constructed as to be visible all round the horizon at a distance of at least one statute mile, and shall exhibit it in any position in the after part of the vessel above the gunwale where it can best be seen.

"(*e.*) If a trawling vessel at work becomes stationary in consequence of her gear getting fast to a rock or other obstruction, she shall show the light required to be shown by a vessel at anchor.

"(*f.*) Fishing-vessels and open boats may at any time use a flare-up in addition to the lights which they are by this article required to carry and show.

"(*g.*) Every fishing vessel, and every open boat, when at anchor between sunset and sunrise, shall exhibit a white light visible all round the horizon at a distance of at least one statute mile."

The above is the report agreed to by the joint committee at their meeting on the 30th March.

T. H. FARRER.

No. 2.

Board of Trade to Foreign Office.

M. 7991.] Board of Trade, *Whitehall Gardens, April* 8, 1881.

Sir: With respect to the previous correspondence on international steering and sailing rules for preventing collisions at sea, it will be remembered that these rules have been adopted by all maritime nations, that they were sanctioned by an order in council dated the 14th day of August, 1879, but that Article X of those regulations relating to the lights to be carried by fishing-vessels was suspended until the 1st day of September, 1881, by an order in council dated the 24th March, 1880, and that this proposed suspension was notified to the foreign office by a letter dated the 17th day of March, 1880, and was by them communicated to the foreign governments concerned. Since then the article in question has been the subject of much discussion in this country. On most of the points involved in it a practical agreement has been arrived at, but there is one point upon which opinion is still somewhat divided in this country, and upon which it is desirable to obtain the views of the foreign governments principally concerned. The point in question is, "what should be the distinguishing light carried by a trawling vessel when at work, attached to her trawl, and making way through the water?" Those who represent the trawlers are anxious that this light should be a single white light carried at the mast-head, on the ground that this light, though not sanctioned by law, has been constantly carried by such vessels, and that it is in their opinion the best light for preserving them from collision. On the other hand it has been considered by the nautical authorities who advise the Admiralty and the Board of Trade on these questions, that a single white light would not be desirable for trawlers under way, for various reasons. They think that considering the number of trawling vessels at work on different parts of the coast a single white light might often be mistaken either for an anchor-light or for a steamer's mast-head light when the side lights are not visible. They think, further, that considering the number of lights near the coast there might be confusion with shore-lights, and that the multiplication of white lights is likely to lead to difficulty and danger; and lastly, they think that there are great objections to giving to trawling vessels the same distinguishing light as is used for pilot vessels.

This last objection is aggravated by the circumstance that, according to the rules, both trawling vessels and pilot vessels use a flare in addition to their distinguishing light. It has, indeed, been suggested that the lights of pilot vessels should be altered, and that these vessels should be distinguished by adding another colored light. But to this it is replied, that any alteration in the lights of pilot vessels is to be deprecated in the important interests of the mercantile marine of the world; that the present pilot lights are matters of world-wide practice and notoriety; and that to alter them for the sake of the trawlers would lead to great inconvenience and even danger, not only on the coasts of the United Kingdom, but in other parts of the world; that it is of extreme importance that a merchant vessel on approaching land should know how to look for and distinguish a pilot, and that it would be long before the masters of merchant ships, who are accustomed to the present distinguishing pilot lights, would learn any new distinction. The advisers of the board of trade and the admiralty are of opinion that the principal light of a trawler should be such

as to distinguish her from other vessels, and that her lights should also be such as to give an approaching ship a general indication of the direction of the trawling vessel's head; they have therefore recommended that the distinguishing lights of a trawler when at work should be a red light at the mast-head, with a subsidiary white light shown aft above the gunwale.

Under these circumstances the board of trade are anxious to ascertain from the Governments of France, Belgium, Holland, Denmark, Germany, and Norway, and possibly also of the United States, what are their views upon the subject generally, and especially upon the question whether the distinguishing light of a trawling vessel when at work should be a single white light, or a red light at the mast-head, with a subsidiary white light shown aft anywhere above the gunwale.

A copy of the article applicable to the lights of all fishing-vessels, as the advisers of Her Majesty's Government have proposed to alter it, is appended, in order that it may be submitted to the foreign governments with this letter.

I have, &c.,

T. H. FARRER.

[Inclosure in No. 2.]

Proposed new article to be substituted for the suspended article 10..

ART. 10. (*a.*) All fishing-vessels and fishing boats of 20 tons net registered tonnage or upwards, when under way, and not having their nets, trawls, or lines in the water, shall carry and show the same lights as other vessels under way.

(*b.*) Open boats and fishing-vessels of less than 20 tons net registered tonnage, when under way, and when not having their nets, trawls, or lines in the water, shall not be obliged to carry the colored side lights; but every such boat and vessel shall in lieu thereof have ready at hand a lanthorn with a green glass on the one side and a red glass on the other side, and on approaching to or being approached by another vessel such lanthorn shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side, nor the red light on the starboard side.

(*c.*) A vessel or boat employed in drift-net fishing, when drifting with her nets, shall not show the colored side lights, but in lieu thereof shall carry two white lights, in lanthorns so constructed that the lights will show round the horizon, and be visible on a dark night, with a clear atmosphere, at a distance of not less than three statute miles; and these lights shall be exhibited where they can best be seen, and so that one of them is at least six feet higher than, but not necessarily immediately over the other.

(*d.*) A trawling vessel at work and attached to her trawl shall not show the colored side lights, but shall carry at the foremast head, or in any other position, on or in front of the foremast where it can best be seen, a red light in a lanthorn so constructed that the light will show all round the horizon, and be visible on a dark night, in a clear atmosphere, at a distance of not less than two statute miles. She shall also carry a white light so constructed as to be visible all round the horizon at a distance of at least one statute mile, and shall exhibit it in any position in the after part of the vessel above the gunwale where it can best be seen.

(*e.*) If a trawling vessel at work becomes stationary in consequence of her gear getting fast to a rock or other obstruction, she shall show the light required to be shown by a vessel at anchor.

(*f.*) Fishing-vessels and open boats may at any time use a flare-up in addition to the lights which they are by this article required to carry and show.

(*g.*) Every fishing-vessel and every open boat when at anchor between sunset and sunrise shall exhibit a white light visible all round the horizon at a distance of at least one statute mile.

No. 3.

Copy of letter from the board of trade to shipowners and others.

M. 9384.] BOARD OF TRADE (MARINE DEPARTMENT).
Whitehall Gardens, S. W., April, 1881.

It is scarcely necessary to remind you that general regulations for preventing collisions at sea, after having been revised by a joint committee* appointed by the Admiralty, the Trinity House, and the Board of Trade, were agreed to by foreign maritime nations, and were sanctioned and made law by an order in council dated 14th August, 1879.

The tenth article of this code was as follows:

"ARTICLE 10. (*a.*) Open fishing-boats and other open boats, when under way, shall not be obliged to carry the side lights required for other vessels, but every such boat shall in lieu thereof have ready at hand a lantern with a green glass on the one side and a red glass on the other side; and on the approach of or to other vessels, such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side, nor the red light on the starboard side.

"(*b.*) A fishing-vessel and an open boat when at anchor shall exhibit a bright white light.

"(*c.*) A fishing-vessel, when employed in drift-net fishing, shall carry on one of her masts two red lights in a vertical line one over the other, not less than three feet apart.

"(*d.*) A trawler at work shall carry on one of her masts two lights in a vertical line one over the other, not less than three feet apart, the upper light red and the lower green, and shall also either carry the side lights required for other vessels, or, if the side lights cannot be carried, have ready at hand the colored lights as provided in article 7, or a lantern with a red and a green glass, as described in paragraph (*a*) of this article.

"(*e.*) Fishing-vessels and open boats shall not be prevented from using a flare-up in addition, if they desire to do so.

"(*f.*) The lights mentioned in this article are substituted for those mentioned in the twelfth, thirteenth, and fourteenth articles of the convention between France and England, scheduled to the British sea fisheries act, 1868.

"(*g.*) All lights required by this article, except side lights, shall be in globular lanterns so constructed as to show all round the horizon."

To this article various objections were taken, and the operation of the act was suspended until the 1st September, 1881. The subject was considered by a select committee of the House of Commons, who reported that certain alterations in the article were required. †

The article has consequently been considered by the joint committee appointed by the admiralty, the Trinity House, and the board of trade; and they have agreed in recommending the adoption of the alteration proposed by the select committee of the House of Commons, with one exception, which is as follows: The select committee recommended that the distinguishing light for trawlers should be a single white light carried at the mast-head, and that the question of some further distinctive lights for pilot vessels which now carry the same distinctive light, should be considered.

The joint committee were unable to agree with this recommendation, for the following reasons:

1. That it is undesirable to multiply the number of white lights; that considering the number of trawling vessels at work on different parts of the coast, a single white light might often be mistaken either for an anchor light or for a steamer's mast-head light when the side lights were not visible. It might also lead to confusion in the case of shore lights.

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* This committe consisted of the following persons:
1. Admiral Sir Richard Collinson, K. C. B., deputy master of the Trinity House.
2. Admiral Bedford, professional officer, harbor department, Board of Trade (deceased).
3. Captain F. I. O. Evans, R. N., Hydrographer, Admiralty.
4. Thomas Henry Farrer, esq., Permanent Secretary, Board of Trade.
5. Thomas Gray, esq., Assistant Secretary, Marine Department, Board of Trade.
6. Captain Digby Murray, Professional Officer, Marine Department, Board of Trade.
7. Captain Sir George S. Nares, K. C. B., R. N., Professional Officer, Harbor Department, Board of Trade, *vice* Admiral Bedford (deceased).
8. H. C. Rothery, esq., Wreck Commissioner.
9. Captain C. G. Weller, one of the Elder Brethren of the Trinity House.

† Parliamentary paper, No. 285, Session 2, 1880.

2. That it is important in the interests of the mercantile marine to maintain a distinction between the lights of pilot vessels and those of trawlers, and that it is undesirable to alter the lights of pilot vessels; that the present pilot lights are matters of world-wide practice and notoriety, and that to alter them for the sake of the trawlers would lead to great inconvenience, and even danger, not only on our own coasts, but in other parts of the world; that it is obviously of extreme importance that a merchant vessel on approaching land should know at once how to look for and distinguish a pilot, and it would be long before the masters of merchant ships, who are accustomed to the present distinguishing light, would learn the new distinction; and, finally, that it is very doubtful whether foreign nations could be induced to agree to so important and dangerous a change.

3. That a suggestion to the effect that a trawler should be allowed to use one light when trawling within pilotage waters, and another and a different light when beyond pilotage waters, has been brought before the committee and considered by them; but that they are of opinion that it is not advisable or even practicable to adoptit.

4. That the principal light for a trawler should be such as to distinguish it from other vessels, and that her lights should also be such as to give to an approaching ship a general indication of the direction of the head of the trawler.

5. That consequently the distinguishing light for a trawling vessel at work should be a red light at or near the mast-head, with a subsidiary white light, such as its anchor light, to be carried in the after part of the vessel anywhere above the gunwale.

The board of trade are anxious to obtain the opinions of those interested upon the question whether the light of a trawling vessel when at work should be—

A white light at the mast-head, with the right to show a flare at intervals; or,

A red light at the mast-head, with a subsidiary white light to be shown aft above the gunwale, with a right to show a flare at intervals.

They will be glad if you will give them the benefit of such opinion as you are able to form or gather on this question.

A copy of the article 10, as lastly proposed by the joint committee, is attached.*

I have, &c.,

THOMAS GRAY.

No. 32.

Mr. Hunt to Mr. Blaine.

NAVY DEPARTMENT,
Washington, May 2, 1881.

SIR: Referring to your letter of the 22d ultimo, with respect to the error in the circular of the 5th of October last of the Department of State, containing the "regulations for preventing collisions at sea," and inclosing a draft of proposed supplementary circular, with request for an expression of my views upon the subject and for any suggestions thought proper, I have the honor to transmit copy of a report, dated the 28th ultimo, from Commodore Whiting, Chief of the Bureau of Navigation, to whom your letter and its accompaniments were referred.

Very respectfully, &c.,

WM. H. HUNT,
Secretary of the Navy.

[Inclosure.]

Commodore Whiting to Mr. Hunt.

No. 8.] BUREAU OF NAVIGATION, NAVY DEPARTMENT,
Washington, April 28, 1881.

SIR: I have the honor to report that the letter from the Department of State of the 22d instant, and its inclosures, relating to the "regulations for preventing collisions at sea," have been carefully examined, and beg leave to submit the following remarks:

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* See inclosure in No. 2.

1st. The draft of the proposed supplementary circular to consular officers of the United States at maritime ports seems to be entirely satisfactory, as it corrects the only error contained in a previous circular, and, in addition, conveys the information presented in the order of the council of Her Britannic Majesty under date of the 27th of November, 1880.

2nd. As regards the regulations as printed in H. Ex. Doc., No. 55, Forty-sixth Congress, second session, it is found that, in so far as any errors would affect the circular which it is proposed to issue, the executive document is correct; but a careful comparison of the entire text of the document with all the originals which it quotes shows the following errors, namely:

Page 11, fourth title, "regulations for preventing collisions (on the water)," should be "regulations for preventing collisions on the water."

Page 12, art. 3, first line: "All steam-vessels (sea-going steamships) when," &c., should be "All steam-vessels when," &c.

Page 12, art. 4, third line: "Each of these mast-head lights shall of the." The word "be" should be inserted between "shall" and "of," so as to read "shall be of the," &c.

Page 13, art. 14, first line: "If the two ships." The word "the" should be omitted.

Page 13, art. 15, first line: "If the two ships." The word "the" should be omitted.

Page 27, art. 15, third paragraph: "Cases to which it does not apply." The word "not" should be omitted.

3d. In connection with this subject, and in compliance with the request of the honorable Secretary of State that any suggestion which might be proper should be made, I beg leave further to say that it appears of grave importance that some steps should be taken, either by the State or Treasury Department, to inform the masters of vessels engaged in deep-sea, and more especially in in-shore, fishing within the jurisdiction of the British colonies, that certain lights, heretofore unknown to them, must be carried after September 1, 1881, by them when engaged in their work, viz:

When drift-net fishing they must carry two red lights in a vertical line, not less than three feet apart, on one of their masts.

When trawling they must carry a red and a green light in a vertical line, not less than three feet apart, on one of their masts, the red light over. They must, in addition, carry side lights.

The lights in both cases must show all round the horizon.

No means have been taken to warn fishermen of these new arrangements, notwithstanding that their work is performed within foreign waters. The warning should be given in the United States ports of departure, where, I believe, the State Department is not represented. The subject is certainly one of the greatest importance to the United States fishing interest, since a violation of these regulations renders our vessels liable to seizure and confiscation, or to a libel amounting to more than the entire profits from a cruise.

The information necessary for their protection is contained in Article X of the new regulations, of which paragraphs *c*, *d*, *e*, *f*, and *q* do not go into effect until September 1 of the present year, but plenty of time should be allowed to the fishermen to enable them to provide themselves with the new and additional lights. The lights which they now carry are, as a rule, not available for carrying out the regulations.

The letter of the honorable Secretary of State and inclosures, above referred to, are herewith returned.

Very respectfully, &c.,

WM. D. WHITING,
Chief of Bureau.

No. 33.

Mr. Blaine to Mr. Windom.

DEPARTMENT OF STATE,
Washington, May 7, 1881.

SIR: I have the honor to transmit herewith for your information and consideration, a circular of the marine department of the board of trade containing alterations and additions to the code of signals for the year 1880, the same having been received from the British legation at this capital for communication to the proper department of this government.

I have, &c.,

JAMES G. BLAINE.

No. 34.

Mr. Blaine to Mr. Windom.

DEPARTMENT OF STATE,
Washington, May 7, 1881.

SIR: I have the honor to acknowledge the receipt of your communication of the 21st ultimo, acknowledging the receipt of the copies of the British order in council for preventing collisions at sea, transmitted to you in the letter of this Department, dated the 18th of the same month.

In view of the fact that the international regulations, referred to in the above-mentioned order in council, have not received the sanction of the Congress of the United States, you suggest that the proper steps be taken to secure Congressional action in the matter at the earliest opportunity at the next session.

I concur with you as to the expediency of such a course, and the subject will accordingly be urged by this Department upon Congress at its next session. Its importance will probably make collateral urgency on the part of the Treasury and Navy Departments expedient.

I have, &c.,

JAMES G. BLAINE.

No. 35.

Mr. Windom to Mr. Blaine.

TREASURY DEPARTMENT,
May 9, 1881.

SIR: I have the honor to acknowledge receipt of your letter of the 7th instant relative to the British order in council for preventing collisions at sea, and stating that in view of the international regulations to which the order in council refers, not having received the sanction of the Congress of the United States, the necessity of such sanction will be urged upon Congress at its next sessions by the Department of State.

I have to inform you that this Department also recognizes the importance of a prompt settlement of the case when Congress assembles, and that it will unite with your Department in its efforts to secure the necessary legislation in the premises.

Very respectfully,

WILLIAM WINDOM,
Secretary.

No. 36.

Mr. Blaine to Mr. Windom.

DEPARTMENT OF STATE,
Washington, May 13, 1881.

SIR: Referring to previous correspondence concerning the regulations for preventing collisions at sea, I have the honor to transmit here-

with for your information and consideration the document relating to the subject, which is described below.

I have, &c.,

JAMES G. BLAINE.

(Inclosures:) A document entitled Lights for Fishing Vessels. Return from the board of trade to the House of Commons, dated April 25, 1881. See inclosure in note of Sir E. Thornton to Mr. Blaine, April 30, 1881.

No. 37.

Mr. Blaine to Sir Edward Thornton.

DEPARTMENT OF STATE,
Washington, May 13, 1881.

SIR: Referring to previous correspondence, I have the honor to acknowledge the receipt of your note of the 30th ultimo, inclosing a new article which it is proposed to substitute for the suspended Article X of the international regulations for preventing collisions at sea, which you submit for the consideration of this government.

I beg to inform you in reply that the subject in question is receiving the attention of the proper departments of this government, and that when a conclusion shall be reached, you will be duly advised of the result.

I have, &c.,

JAMES G. BLAINE.

No. 38.

Mr. Blaine to Mr. Hunt.

DEPARTMENT OF STATE,
Washington, May 17, 1881.

SIR: I have the honor to acknowledge the receipt of your letter of the 2d instant, with the inclosures, in relation to the "rules for preventing collisions on the water," approving of the draft of a circular to be issued by this Department to the consular officers of the United States at maritime ports, which was submitted to you on the 22d of April, for the consideration of your department.

Since the receipt of your letter, now adverted to, the Department has received a note from Her Britannic Majesty's minister accredited to this government, under date of the 30th ultimo, a copy of which is herewith inclosed, accompanied by a new article proposed by the board of trade to be substituted for the suspended Article X. Her Majesty's Government are desirous of ascertaining the opinion of this government on the general question of lights for fishing vessels and particularly on the question whether the distinguishing light of a trawler at work should be a simple white light or a red light at the mast-head with a subsidiary light shown aft anywhere above the gunwale.

I shall thank you, therefore, if you will take the subject into consideration and advise me of the views of your department upon the points

suggested; and if the promulgation of the supplementary circular should be delayed until it be ascertained whether the new Article X will be substituted for the one now included in the regulations, the return of the printed inclosure is particularly requested.

I have, &c.,

JAMES G. BLAINE.

No. 39.

Mr. Blaine to Mr. Windom.

DEPARTMENT OF STATE,
Washington, May 18, 1881.

SIR: Adverting to former correspondence upon the subject, I have now the honor to submit to your consideration a copy of a note of the 30th ultimo from Her Britannic Majesty's minister accredited to this government with reference to the "regulations for preventing collisions on the water." It is accompanied by a new article proposed by the board of trade to be substituted for the suspended Article X.

Previous to the receipt of Sir Edward Thornton's note, now adverted to, this Department had prepared and was about to submit to your consideration, a draft of a circular, a copy of which is herewith inclosed, supplementary to that of the 5th of October, 1880, which had been submitted to the Secretary of the Navy. The circular is accompanied by a report of the Chief of the Bureau of Navigation of the Navy Department, of the 28th ultimo, in which he earnestly submits that immediate steps should be taken to promulgate so much of the new rules as relates to the fishing interests of the United States in order to secure the desired protection to those interests while engaged in deep-sea, and especially in in-shore fishing within the jurisdiction of the British colonies on the north. This supplementary circular, as will be perceived, has met with the sanction of the Navy Department, but in view of the new phase of the subject as regards the suspended Article X, the Department may possibly delay the promulgation of that circular until it is finally ascertained whether or not the proposed substitute for that article will be adopted.

Referring to the letter of the Acting Secretary of the Treasury of the 2d of September, 1880, upon the subject, I have the honor to inquire whether in consideration of the opinions therein expressed it would be deemed proper or expedient by your Department to add your approval to the supplementary circular—and whether your Department will undertake at the proper time to instruct the collectors of ports of the United States which our fishermen frequent, respecting the force of that clause of the regulations which concerns them. I would inquire further, if you think it proper in any case to bring the terms of the regulations to the notice of our fishermen prior to hearing further from Her Majesty's Government.

I have, &c.,

JAMES G. BLAINE.

No. 40.

Mr. Hunt to Mr. Blaine.

NAVY DEPARTMENT,
Washington, May 25, 1881.

SIR: I have the honor to acknowledge the receipt of your letter of the 17th instant, with inclosures from Her Britannic Majesty's minister to the United States, asking for an expression of an opinion with regard to a proposed modification of Article X of the revised international regulations for preventing collisions at sea.

In reply I have the honor to state that after a careful examination of the British confidential circular No. 4420, I am of the opinion that the reasons advanced by the nautical authorities who advise the admiralty and board of trade, for carrying a red and a white light by trawlers when engaged in fishing, are sound and of sufficient importance to make such an arrangement highly necessary; whilst the reasons advanced by those who represent the trawlers, for the retention of the old light, are simply those of convenience and of avoiding a slight additional expense, and consequently are not worthy of consideration.

In the opinion of the Navy Department, therefore, the modified Article X (as given in the confidential circular No. 4420) appears to thoroughly accomplish the desired object and should be approved by the United States Government.

The promulgation of the proposed supplementary circular to consular officers of the United States need not, in my opinion, be delayed, as the proposed Article X has not yet been adopted.

The printed confidential circular No. 4420 is herewith returned as requested.

Very respectfully, &c.,

WILLIAM H. HUNT,
Secretary of the Navy.

No. 41.

Mr. Windom to Mr. Blaine.

TREASURY DEPARTMENT, *May* 26, 1881.

SIR: I have to acknowledge receipt of your letter of the 18th instant, submitting for my consideration certain correspondence, covering an amendment to the "international regulations for preventing collisions at sea," and an amended circular which your Department proposes to issue.

In reply I have to say, that while recognizing the importance of the adoption of these regulations by the United States, in view of the facts that section 4233 of the Revised Statutes provides similar regulations for vessels of the American merchant marine and that no Congressional action has been had in the matter, this department must decline to take further action in regard thereto.

Very respectfully,

WILLIAM WINDOM,
Secretary.

No. 42.

Mr. Drummond to Mr. Blaine.

NORTH HAMPTON, N. H., *July* 27, 1881.

SIR: Sir Edward Thornton transmitted to you on the 30th of April last copies of a letter from the board of trade, inclosing a new article which it is proposed to substitute for the suspended Article X of international regulations of maritime states for the prevention of collisions at sea, as forwarded to your predecessor in office, Mr. Evarts, in April, 1880.

I have the honor to inform you that the board of trade are most anxious to have an early answer to the inquiry Sir Edward Thornton made in his note to you with respect to the views of the United States Government on the subject of lights to be carried by fishing vessels, and Earl Granville has consequently instructed me to ask you to be good enough to inform me as soon as possible of the reply of the United States Government.

I have, &c.,

VICTOR DRUMMOND.

No. 43.

Mr. Blaine to Mr. Drummond.

DEPARTMENT OF STATE,
Washington, August 2, 1881.

SIR: Referring to my reply of the 13th of May last, to Sir Edward Thornton's note of the 30th of the proximo month, asking the opinion of this government on the general question of lights for fishing vessels, and particularly on the question whether the distinguishing light of a trawler at work should be a single white light or a red light at the masthead with a subsidiary white light shown aft anywhere above the gunwale, I now have the honor to acknowledge the receipt of your note of 27th ultimo, on the same subject, and to inform you in reply that in view of the fact that section 4233 of the Revised Statutes of the United States provides regulations on this subject for American fishing vessels, the executive branch of this government can do no more than submit this matter to Congress for consideration at its next session.

I have, &c.,

JAMES G. BLAINE.

No. 44.

Mr. West to Mr. Frelinghuysen.

WASHINGTON, *March* 16, 1882.

SIR: With reference to Sir Edward Thornton's note of the 30th of April last, to the note in reply thereto of the 13th of May, to the note of Her Majesty's chargé de affaires, of the 27th of July, and to the note

from the Department of State, of the 2d of August, on the subject of the proposed new Article X of the international steering and sailing rules for preventing collisions at sea, I have the honor to inform you, that I am instructed by Earl Granville, to state that as replies from all governments to whom a similar communication was made, had not been received by the end of August last, it has been found necessary to issue an order in council for keeping in force Article IX of the old rules, for which the proposed new Rule X was to be substituted until the 1st September, 1882.

In communicating this information to the United States Government, I am further instructed to say that the Governments of Denmark, Holland, Belgium, and France have, more or less, agreed to the new article, but that no definite reply has been received from them or from the Government of Germany, and at the same time to ask for an answer to the communication which, as above stated, was made to the United States Government on this subject in the course of last year, and which, according to the note of the State Department of the 2d of August last, was to be submitted to Congress.

I have, &c.,

L. S. SACKVILLE WEST.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 161.

LETTER

FROM THE

SECRETARY OF THE INTERIOR,

TRANSMITTING

Copy of report, dated 15*th instant, from the Commissioner of Indian Affairs, and accompanying papers, in response to Senate resolution of March* 13, 1882, "*requesting list of all Indian reservations upon which troops are stationed; also such information as may be on file in that department touching the destruction and inordinate consumption of timber by the troops upon such reservations,*" &c.

APRIL 19, 1882.—Referred to the Committee on Indian Affairs and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, April 17, 1882.

SIR: I have the honor to acknowledge the receipt of Senate resolution, dated March 13, 1882:

That the Secretary of the Interior be, and he is hereby, directed to transmit to the Senate a list of all Indian reservations upon which troops are stationed; also, such information as may be on file in his department touching the destruction and inordinate consumption, of timber by the troops upon such reservations, with a statement of his opinion as to the necessity of the continuance of the military thereon, respectively.

In reply, I transmit copy of report, dated 15th instant, from the Commissioner of Indian Affairs, and accompanying papers therein referred to.

Very respectfully,

A. BELL,
Acting Secretary.

The PRESIDENT *pro tempore of the Senate.*

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, April 15, 1882.

SIR: I have the honor to be in receipt by department reference, for report, of a Senate resolution dated 13th ultimo directing the Secretary of the Interior "to transmit to the Senate a list of all Indian reservations upon which troops are stationed; also, such information as may be on file in his department touching the destruction and inordinate consumption of timber by the troops upon such reservations, with a statement of his opinion as to the necessity for the continuance of the military thereon, respectively," and respectfully submit herewith a list of Indian reservations on which troops are stationed, showing also the number of troops at each of such military posts, prepared from the

latest official reports. This list (marked A) embraces only posts which are located *on* Indian reservations. I inclose, also, a list (marked B) of military reservations declared by executive orders and located within Indian reservations.

I have not the data at hand to show the amount of timber consumed at *all* of the military posts situated on reservations, but respectfully call attention to the fact that all, or nearly all, of those embraced in list A are located in prairie countries, where timber is not plentiful and is found only in limited quantities and in the immediate vicinity of water-courses; inviting special attention to the posts on the Missouri River, at Standing Rock, Cheyenne River, and near Crow Creek Agencies, the military posts at those points being known as Fort Yates, Fort Bennett, and Fort Hale, respectively.

The consumption of wood at Fort Yates has been the subject of extended correspondence in the last three or four years between this and the War Department, and as showing the necessity for some action to remove the troops and stop the indiscriminate destruction of timber at military posts on Indian reservations I inclose herewith copies of the following correspondence:

1. Reports of this office dated July 8 and November 11, 1881, together with the letter dated November 2, 1881, from James McLaughlin, United States Indian agent, referred to in the report of November 11.

2. Letter dated February 17, 1882, from the Hon. Secretary of War, and accompanying documents.

Attention is also invited to the annual report of this office for 1881, on this subject, found on page 29 of said report. After the transfer of the Sitting Bull Indians to Standing Rock Agency, in July of last year, it was deemed advisable that the troops be continued at Fort Yates for a time, but the greater part of those Indians have been distributed to the other Sioux Indian reservations at Cheyenne River, Pine Ridge, and Rosebud Agencies, and the necessity for troops at Standing Rock Agency no longer exists, so far as the preservation of peace among the Indians is concerned.

I inclose also a copy of a letter dated March 31, last, from the United States Indian agent at Cheyenne River Agency, Dakota, near Fort Bennett, in which he reports that the "military has made such extravagant use of the wood that there is no wood to be found within a radius of 20 miles of this agency," and that he "can see no necessity for continuing the troops at this point."

In regard to the influence of soldiers upon Indian women and the necessity of continuing the troops at Fort Bennett, General Howard, one of the Indian inspectors, recently reported as follows:

> Soldiers exert a bad influence upon the women; their presence is corrupting to the families, injurious to the young men and other Indians, who see them living in so much idleness. It is bad for the Indians to be under a sort of military restraint. They should become accustomed to civil ways and restraints. The agent should learn to govern them without recourse to the military. In no other way can they grow up to habits of self-government.
>
> These conditions, together with all the evils mentioned as accruing from the presence of the military trader, make it clear that the post had better be removed.

In regard to the military post at Fort Hale, which is on the west bank of the Missouri River, on the Sioux reservation, and nearly midway between Crow Creek Agency and Lower Brulé Agency, I inclose extracts from a report, dated 27th ultimo, by the United States Indian agent at Lower Brulé Agency, showing that during the past fiscal year the amount of wood consumed by the military and disposed of by the military post-trader "will not be far below 1,200 cords," and I am relia-

bly informed that unless measures are promptly taken to stop the destruction of timber at this point, only a very few years will elapse until there will not be a tree left for fire-wood, and then other fuel will have to be supplied for the Indians or they must be removed. The Indian agents at the agencies named are of the opinion that with their Indian police force they are abundantly able to maintain order among their Indians without the presence of troops, and the correctness of this opinion is sustained by the fact that at Pine Ridge Agency, which is at the least 40 miles, and Rosebud Agency, which is 140 miles from a military post, no difficulty is experienced in preserving order and maintaining discipline among the Indians by the use of the Indian police force alone. The agents at both of these agencies have now nearly twice as many Indians to control as are at Standing Rock Agency, and the Indians are precisely of the same class, and I know of no reason why the agencies on the Missouri River, with not nearly so many Indians, cannot be kept in order without troops as well as those at Pine Ridge and Rosebud.

In my opinion there is no necessity for any troops at Fort Yates; those at Fort Bennett should be removed to Fort Sully, a few miles farther down, and on the opposite side of the Missouri River, and the post at Fort Hale is utterly unnecessary for any good purpose.

The Senate resolution is herewith returned.

Very respectfully, your obedient servant,

H. PRICE,
Commissioner.

Hon. S. J. KIRKWOOD,
Secretary of the Interior.

A.

List of military posts stablished on Indian reservations.

State or Territory.	Military post.	Indian Reservation.	Occupying force.
Dakota	Fort Bennett	Sioux Reserve	43
Do	Fort Hale	do	100
Do	Fort Yates	do	259
Indian Territory	Cantonment on North Fork Canadian.	Cheyenne and Arapaho	181
Do	Fort Reno	do	287
Do	Fort Supply	Unoccupied land	135
Montana	Fort Custer	Crow Reserve	368
Do	Camp Poplar River	Blackfeet	59
Do	Rocky Point	do	23
Wyoming	Fort Washakie	Wind River Reserve	99

B.

List of military reservations declared by Executive orders within Indian reservations.

State or Territory.	Military post.	Indian reservation.	Occupying force.
Arizona	Fort Apache	San Carlos	201
California	Fort Gaston	Hoopa Valley	46
Dakota	Fort Randall	Sioux	233
Do	Fort Totten	Devil's Lake	168
Idaho	Fort Hall	Fort Hall	46
Indian Territory	Fort Gibson	Cherokee Nation	91
Do	Fort Sill	Kiowa and Comanche	231
Montana	Fort Assiniboine	Blackfeet	429
Do	Fort Buford *		211

* A small part of this military reservation is within Blackfeet Indian Reserve.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, July 8, 1881.

SIR: Under date of May 11, 1880, this office forwarded to the department a copy of a petition by four of the leading chiefs at Standing Rock Agency, complaining of the extravagant use and waste of the wood and timber on the reservation by the troops stationed at Fort Yates. Attention was called to the occasion for the call, in December, 1874, by agent Palmer, for the temporary presence of a company of troops to enable him to enroll the Indians, to which they were strongly opposed, when a detachment of sixty men and three commissioned officers were furnished from Fort Lincoln, that number being stated by the department commander to be "amply sufficient to meet the wants of the situation," to the unnecessary and unsought increase in the number of troops stationed there from time to time, until a force has been accumulated sufficient to keep in check the whole Sioux Nation, while the force at Fort Lincoln, less than 60 miles above Standing Rock, could be readily made available in any emergency likely to arise; and to the report of Inspector Vandeveer, in the fall of 1875, that "twelve or fifteen soldiers is all that need be stationed here."

In that letter the following language was used:

"In regard to the wood and timber cut by the military, the Indians have just cause of complaint. The attention of the office has frequently been called to the subject, and I refer to office report of March 10, 1877, which will afford important information relative to the large amount of wood and timber on the reservation, cut and used under the direction and authority of the military, the contracts awarded by military officers to the post-trader and other persons for supplying steamers with wood, without consulting the agent or this office, and the large amount of timber or logs cut to erect barracks, buildings, &c. The honorable Secretary of War, on the recommendation of this office, was requested to cause the necessary order to be issued to restrain the officers at this and other military posts from cutting any timber except such as was absolutely necessary for the use of their respective posts.

"But so far as Standing Rock is concerned, there has been but little change for the better, and there are just and grave apprehensions that if the present large military force is continued at the agency, and the wood disappears as it has for the past five years (at the rate of about 4,000 cords of wood per annum), the Indians in a short time will be entirely destitute of fuel and timber for building purposes, and thus a needless and heavy expense will be entailed upon the government for the necessary supplies."

This letter having been forwarded to the War Department, and having, as appears, been referred to the General of the Army, that officer reported that it would give him "great pleasure," and would enable him "to use the troops elsewhere, to call off the entire garrison at Standing Rock," if he could have "some assurance that the agent" would "not again call for them at a time when they" could "not be had."

In office letter of June 3, to the department, my immediate predecessor said: "I can without hesitation give the assurance that, in case they [the troops] are withdrawn, they will not be called for again unless in some extraordinary emergency," and recommend that the honorable Secretary of War be requested to cause the necessary orders to be issued for the withdrawal of the garrison at Standing Rock Agency, as indicated by the General of the Army.

On the 23d of the same month this office again drew attention to the matter, and renewed the recommendation for the removal of the troops, transmitting, at the same time, a copy of a letter from Agent Stephan on the subject, showing that the necessity for troops at this point had passed, and that action should be taken for their removal.

Again, on the 30th of August, 1880, this office, in response to the departmental reference of a letter dated June 30, 1880, from the honorable Secretary of War, inclosing a communication from the president of the Northern Pacific Railroad, in which the necessity for the continuance of the garrison at Fort Yates was urged as a protection to those engaged in the construction of that road and to settlers in its vicinity, forwarded a copy of a report of the agent at Standing Rock Agency, showing that there was no good ground for apprehension of trouble to the road or settlers, and that even if there were, Fort Lincoln and other posts along the line of the road would be amply able to afford all necessary protection. This office fully concurred in the opinion expressed by the agent that the rapid consumption of wood, timber, and hay, by the garrison at Fort Yates, would soon so deplete the sources of supply as, at no distant day, to necessitate the removal of the troops or the Indians, or both.

I deem it proper again to invite the attention of the department to the matter, and respectfully to recommend that the honorable Secretary of War be urged to cause the necessary steps to be taken to reduce the garrison at that fort to not more than one company. The presence of that force temporarily may be advisable in view of the fact that the recently surrendered followers of Sitting Bull are now there, and will probably remain a short time; but of the whole number recently sent there from Forts Buford and Keogh, only about 500 belong to Standing Rock Agency, the remainder

belonging to Cheyenne River, Pine Ridge, and possibly other agencies, and it is believed that one company of troops would be ample for any emergency likely to arise.

Very respectfully, your obedient servant,

H. PRICE,
Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, November 11, 1881.

SIR: I have the honor to transmit herewith copy of a letter dated 2d instant from United States Agent McLaughlin, of the Standing Rock Agency, Dakota, in which he calls attention to the large consumption of wood and hay by the military on the reservation; that this is a source of continual complaint on the part of the Indians, and of very serious embarrassment to the agent.

The wood required for fuel purposes at the fort, and contracted for the present year, amount to 3,300 cords, which, together with that used by the post-trader and attachés of the garrison, he says, will approximate 5,000 cords annually. And the large amounts of timber for building purposes, fences, and general repairs at the garrison are not included in this item. The amount of hay cut for garrison purposes will aggregate about 2,000 tons.

The agent also states that the wood and hay are "taken by the contractors whenever and wherever they feel disposed, cutting it from off the claims where Indians have located and settled upon farms, removing it even from their very doors. Their working camps are established among the Indians, on any part of the reservation, without permission from the agent or consent of the Indians," and no part of the reservation is secure from their ruthless operations.

If this destructive work is allowed to continue, the agent says that "all the timber of every description growing on that part of the reservation which lies between the Cannon Ball and Grand Rivers, a distance of 60 miles, will be entirely exhausted" within five years, and this of course will necessitate the removal of the Indians, or the purchase of wood and lumber for their use at enormous rates.

The attention of the department, within the past three years, has repeatedly been called to this subject, and the War Department has as often been requested to reduce the garrison; but instead of regarding the reasonable requests of this department, and the solemn obligations of the government to these Indians, there seems to be a persistent determination to make Fort Yates a great central point for military operations on the Missouri (as indicated in a recent report of General Terry); to have full supervision of the Standing Rock Reservation, irrespective of any interests or rights that the Indians may have in the matter, or any action taken by this office for their protection. If it is determined to keep this large number of troops (six companies) at said fort, where they have been quartered without consultation with or request from this department, I respectfully recommend that the War Department be requested to issue the necessary orders to prohibit the troops from cutting any wood or timber growing upon the reservation "on the west side of the Missouri River, between the Cannon Ball and the Grand Rivers," as indicated in the agent's letter.

Very respectfully, your obedient servant,

H. PRICE,
Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

UNITED STATES INDIAN SERVICE,
STANDING ROCK AGENCY, *November* 2, 1881.

SIR: I have the honor to report that the meagerness of hay for subsistence of stock, and wood for building and fuel purposes, at this agency, is fast becoming a serious embarrassment to the agent and the source of continual complaint on the part of the Indians.

The large consumption of both these articles by the military, and the indiscriminate manner in which they are obtained, produces an absolute want upon the part of the Indians, and is the cause of their continual protestation at the discrimination that is made against them.

The quantity of wood required for fuel purposes at the garrison of Fort Yates, for the present year, is contracted for to the amount of 3,300 cords, which, together with the wood for use of officers, post-trader, and attachés of the garrison, will approxi-

mate 5,000 cords annually. This quantity is not included in the timber cut on the reservation for buildings, fences, and general repairs at the garrison.

The hay contract for the Quartermaster's Department during the present year is for 800 tons, which, with hay used by the contractors for supplying hay, wood, and beef for the garrison at Fort Yates, will aggregate about 2,000 tons.

This wood and hay thus used is taken by the contractors whenever and wherever they feel disposed; cutting it from off the claims where Indians have located and settled upon farms, removing it even from their very doors; establishing their working camps among the Indians, on any part of the reservation, without permission from the agent or consent of the Indians, and no part of the reservation is secure from their operations.

The timber on this reservation is confined to a narrow strip or belt along the Missouri flats, and for 10 miles both above and below the agency it has been almost entirely cut away.

With the same ratio of consumption during the next five years, all the timber of every character growing on that part of the reservation which lies between the Cannon Ball and the Grand Rivers, a distance of 60 miles, will be entirely exhausted, which will necessitate either the removal of the Indians or the purchase of fuel and lumber for their use at an enormous expense.

In view of these facts, I respectfully urge upon the honorable Commissioner of Indian Affairs that steps be taken at an early date to remedy this evil, and that the military authorities be prohibited in the future from utilizing any wood or hay growing upon this reservation, on the west side of the Missouri River between the Cannon Ball and the Grand Rivers.

I am, sir, very respectfully, your obedient servant,

JAMES McLAUGHLIN,
United States Indian Agent.

Hon. H. PRICE,
Commissioner of Indian Affairs, Washington, D. C.

WAR DEPARTMENT,
Washington City, February 17, 1882.

SIR: I have the honor to acknowledge the receipt of your letter, dated November 15, 1881, inclosing copies of letters, dated November 2 and 11, 1881, respectively, from the Commissioner of Indian Affairs and from United States Indian Agent McLaughlin, of the Standing Rock Agency, Dakota, in relation to the large amount of wood and hay cut from the Indian reservation for the use of the military at Fort Yates.

The Commissioner recommends that orders be issued prohibiting the cutting of any wood or hay by the military from the reservation on the west side of the Missouri River between the Cannon Ball and the Grand Rivers.

In reply, I beg to invite your attention to the inclosed copy of a report on the subject, dated the 7th ultimo, from the commanding general of the Department of Dakota.

I have also to invite your attention to the accompanying copy of an indorsement, dated the 13th instant, of the Quartermaster-General, whose views are approved and will be carried out.

Very respectfully, your obedient servant,

ROBERT T. LINCOLN,
Secretary of War.

The Hon. SECRETARY OF THE INTERIOR.

Indorsements on copy 6306 *A. G. O.*, 1881.

[First indorsement.]

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, November 22, 1881.

Official copy, respectfully referred, together with the original inclosures, through headquarters Military Division of the Missouri, to the commanding general Department of Dakota for report.

The attention of the department commander is invited to the remarks made by him some years ago, when this subject was under consideration (*vide* indorsements of April 6, 1877, April 9, 1879, &c.), and the Secretary of War desires an expression of his views as to whether the objections then made to a full compliance with the wishes of the Interior Department are not now obviated both by the removal of the military neces-

sity then existing and the discovery and development of the lignite beds along the Northern Pacific Railroad.

To be returned.

By command of General Sherman.

R. C. DRUM,
Adjutant-General.

[Second indorsement.]

HEADQUARTERS MILITARY DIVISION OF THE MISSOURI,
Chicago, November 28, 1881.

Respectfully transmitted to the commanding general, Department of Dakota.

By command of Lieutenant-General Sheridan.

R. WILLIAMS,
Assistant Adjutant-General.

[Third indorsement.]

HEADQUARTERS DEPARTMENT OF DAKOTA,
Fort Snelling, Minn., January 17, 1882.

Respectfully returned to headquarters Military Division of the Missouri.

I have delayed making the report called for in the first indorsement hereon, in order that I might obtain more accurate information than that which I possessed when I received this paper.

I regret to say that I find the lignite from the "Bly" mine does not fulfill the expectations which at one time were entertained in respect to it. It proves to be of inferior quality as fuel. On exposure to the atmosphere it crumbles into dust and becomes nearly worthless. If Fort Yates should be supplied with it for the year, the result would probably be suffering to the garrison and loss to the government.

I am as strongly of the opinion that no more fuel for Fort Yates should be cut on the treaty reservation as the honorable Commissioner of Indian Affairs can be. The wood now there should by all means be left for the use of the Indians, and whatever increase of expenses may result from the purchase of other fuel should be accepted as inevitable.

The only practicable way to supply the post with fuel is, I think, to send anthracite coal to it from Duluth. The Scranton coal, brought to Duluth by water, and carried to Bismarck by rail, can be delivered at the last-named place for a price not exceeding $11.75 per ton; I think it can be delivered for $11 per ton. From Bismarck it can be carried to Yates by the steamer Sherman at an insignificant actual outlay.

In the fiscal year ending June 30, 1880, the price of wood at Fort Yates was for 1,000 cords $2.34 per cord; for the remaining 2,768 cords required, $2.47 per cord. For the year ending June 30, 1881, the price was $2.97 per cord. For the current year the contracts for 1,000 cords is $3.72½ per cord; for the remaining 2,276 cords required, $3.94.

Thus it will be seen that the price has risen each successive year during the last three years. This results from the increasing scarcity of wood near the post and the consequent increase of the distance over which it must be hauled. Following the law of increase already developed, we can hardly expect to obtain wood this year for less than $4.50. I think it not at all improbable that we should have to pay $5 per cord.

The amount of wood required for the garrison, when the companies which compose it are filled to the maximum, is 3,850 cords per annum. The cost of this amount, even at $4.50 per cord, would be $16,325. The amount of Scranton coal required under the same conditions would be, in round numbers, 2,000 tons, which at $11.75 per ton would cost $23,500, a sum in excess of the cost of the wood required of $7,150.

I think the importance of the object to be obtained fully justifies this increase of expense, and I recommend that authority be given to advertise for a supply of the Scranton coal to be delivered at Duluth.

In respect to the cutting of hay: If the agent is rightly informed as to the proceeding of the hay contractors (I think that he was not at the time at the agency), those proceedings were indefensible. Had they been brought to my knowledge at the time, I should at once have put a stop to them. It does not, however, follow that no hay for the use of the post should be cut on the reservation. Hay is an annual product, and the cutting of it works no permanent injury. If the Indians need for their own use in any one year all the land near the post they should have it, of course; but I think it will be found that within a reasonable distance of the post there are places from which hay can be cut without detriment to them. This should be made the subject of examination. Unless the place or places where hay may be cut should be first definitely determined, it would be difficult to let a contract, and, therefore, probably the better way would be to authorize the post quartermaster to hire laborers to cut, cure, and stack the hay, government teams being used to haul it.

* * * * * * *

ALFRED H. TERRY,
Brigadier-General, Commanding.

HEADQUARTERS MILITARY DIVISION OF THE MISSOURI,
Chicago, June 24, 1882.

Respectfully forwarded to the Adjutant-General of the Army.
In the absence of the lieutenant-general commanding.

R. WILLIAMS,
Assistant Adjutant-General.

[Fourth indorsement.]

WAR DEPARTMENT, QUARTERMASTER-GENERAL'S OFFICE,
Washington, February 13, 1882.

Respectfully returned to the honorable the Secretary of War.

There are large coal-fields in Iowa as near or nearer than Duluth. There are others in Illinois that would in the nature of things compete for fuel supplies. There are other railways besides the Northern Pacific that reach the Missouri, notably that of Winona and Saint Peter, at Fort Pierre. A change from wood to coal of any kind requires a change of all cook-stoves, ranges, heating-stoves, and fire-places, or the general fuel plant of the post—a serious expense. For this and other reasons it would seem best to advertise for suitable fuel, coal or wood, for heating and cooking purposes, of an equivalent of the quantity of wood to be delivered at the post, no wood to be taken from the reservation except by consent and agreement with the Interior Department. An invitation for such proposals will give all parties in interest an opportunity to compete, and the cheapest fuel, other things considered, may be determined upon. If coal is limited to one kind or one railway its supply may become, or be construed to be, a monopoly. Its handling and transportation, 78 miles, is an indeterminate quantity as to the cost of expenditure, and an accident to the Sherman would lead to a corner in transfer, possibly at a critical time.

In regard to hay, it is believed that if the agent for the Indians is duly paid on their behalf that matters can be satisfactorily arranged.

S. B. HOLABIRD,
Captain, Quartermaster-General, United States Army, in charge.

UNITED STATES INDIAN SERVICE,
CHEYENNE RIVER AGENCY, DACOTA,
March 31, 1882.

SIR: In reply to the questions propounded in office letter of the 16th instant, I have the honor to inform you that the actual number of troops at Fort Bennett is 38 enlisted men and two officers.

The amount of wood consumed annually by the military has been as follows: At this post in 1878 their contract was for 2,200 cords; 1879, 920 cords; 1880, 400 cords; 1881, 162 cords; I believe their contract for this year calls for 175 cords.

The military have made such extravagant use of wood that there is no wood to be found within a radius of 20 miles of this agency.

I can see no necessity for continuing troops at this post; the Indians are quiet and well disposed, and seem anxious to learn the ways of the whites. The more intelligent Indians seem to realize the necessity of becoming self-supporting. They are also desirous of having more domestic comforts, and want better houses, chairs, dishes, cupboards, &c., and so far as the Indians are concerned, I can see no necessity for the troops to remain here.

I would recommend that the Indian police force be increased to 30 members. It gives me pleasure now, after nearly two years' experience with these men, to give it as my opinion that, if well equipped and properly handled and disciplined, an Indian police force can be made a very effective instrument for good.

I am, very respectfully, your obedient servant,

LEONARD LOVE,
United States Indian Agent.

Hon. COMMISSIONER OF INDIAN AFFAIRS,
Washington, D. C.

UNITED STATES INDIAN SERVICE,
LOWER BRULÉ AGENCY, DAKOTA,
March 27, 1882.

SIR: I have the honor to acknowledge receipt of letter, bearing date March 16, 1882, propounding inquiries concerning the garrison at Fort Hale, the amount of wood and timber used, &c.

In reply thereto, I would respectfully state as follows, viz:

Fort Hale is a two-company post, and the garrision at the present time numbers about 100 men, having within a short time been re-enforced by recruits.

The annual consumption of fuel has varied from 500 cords in 1881 to 700 cords for this current year. The post trader also consumes from 75 to 100 cords of wood per year; this is also procured from the Indian reservation.

In addition to the amount of wood as stated above, some 300 to 350 cottonwood logs were cut and sawed (at Crow Creek) during the past summer, the lumber used in building stables, corral, &c., either at the post or upon the island, occupied in part by the post, upon the opposite bank of the river. I think I am not above my estimate in stating that in timber and fuel during the fiscal year the sum total will not be far below 1,200 cords.

The wood contractor for this year made no application to cut in any place, but went ahead in his operations, cutting some 100 to 150 cords in a part specially reserved for the Indians, and which was in dispute partially last year between the wood contractor and myself, and which, by the agreement of the officer in command at Fort Hale, was not to be cut for military uses. Not far from 100 cords were cut before the fact was made know to me; upon representation to the commanding officer it was stopped.

* * * * * * *

The location of Fort Hale is not one that could be defended against a force of fifty men who had a good leader.

The fort is situated on the bottom lands, upon a narrow strip of land, probably 350 to 400 feet from the river, at which point thete is a continual wearing, and it is simply a matter of time "how long" there will be any land between the river and the bluffs. The latter rise from 150 to 250 feet directly in the rear, and from their tops and sides 50 well-armed men could bid defiance to all the force that could be brought. There is but one building, besides the trader's store and house, of value; the rest are log houses and barracks, all much decayed, and all needing quite soon large repairs to make them habitable.

The house of the commandant is quite large, new, well built, convenient, and valuable; the rest are of comparatively little value.

* * * * * * *

From what I have witnessed at Chamberlain, and what has been reported, I can safely say that there is far more need of an armed force in that place than among the Indians. As we are situated about 15 miles from Fort Hale, over a broken country, with no communication but by messenger, any outbreak occurring here would be begun and completed long before any information could be forwarded there, and the march of the troops to this agency, if they were not opposed, could not be made much less than one day.

The settlement of Chamberlain has complicated to some degree the position of the Indians; with the incoming of some who are really of a superior class to those met with ordinarily on the frontier, another class have also appeared who are in no way desirable. From time to time during the past season they have taken possession of the town, and scenes of violence and rioting have been the result; that no lives have been lost is due perhaps more to what is termed by some "luck" than anything else. Some of this class have proposed to visit this side of the river, but have been promptly informed that their presence was not desired and would not be tolerated, and if they came with the intention of making disturbance of any kind they would be arrested and transferred to the fort. Probably this intimation had the desired result. The subject of the quartering of soldiers at Fort Hale was incidentally brought up some time since in a council held at the office, and perhaps the idea of the most enlightened of the Indians is not far from the true idea. One of them, speaking upon the wood and timber question, made the inquiry something like "Why are those soldiers kept in our vicinity? They cut our wood and cut our hay; they pay us nothing for it; they do us no good; we are at peace with the whites; we wish to harm no man; all we want is to live in peace with each other and with the white man."

* * * * * * *

Very respectfully, your obedient servant,

W. H. PARKHURST,
United States Indian Agent.

Hon. COMMISSIONER OF INDIAN AFFAIRS,
Washington, D. C.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 162.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

In response to Senate resolution of the 4th instant, copies of certain papers relating to the construction of a bridge over the Willamette River at Portland, Oreg., &c.

APRIL 24, 1882.—Referred to the Committee on Commerce and ordered to be printed.

WAR DEPARTMENT,
Washington City, April 24, 1882.

The Secretary of War, in response to the resolution of the United States Senate of the 4th instant, calling for copies of certain papers relating to the construction of a bridge over the Willamette River at Portland, Oreg., together with a statement of his views as to the propriety or advisability of the construction of a bridge over said river at said point, and its effect upon the commerce and navigation of the same, has the honor to transmit herewith a letter from the Chief of Engineers of the 22d instant, and the accompanying copies of papers, which it is believed will meet the requirements of the resolution.

These papers contain the views of this department in the matter.

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT *pro tempore*
of the United States Senate.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., April 22, 1882.

SIR: I have the honor to return herewith the resolution of the Senate of the United States of the 4th instant, directing the Secretary of War, "if in his opinion not incompatible with the public interests, to communicate to the Senate full copies of all reports heretofore made to the Chief of Engineers of the War Department by Maj. G. L. Gillespie, major of engineers, relating to the construction of a bridge over the Willamette River, at the foot of Morrison street, in the city of Portland, State of Oregon; also copies of all protests, communications to or from the Chief of Engineers, and papers relating thereto, on file in the War Department, including copies of any and all opinions and decisions of the judges of the United States circuit court for the district of Oregon touching said subject, if copies of any such there be on

file in the department, accompanied by a statement of his views as to the propriety or advisability of the construction of a bridge over said river at said point, and its effect upon the commerce and navigation of the same," and in obedience thereto to submit the accompanying copies of papers called for, which will, it is believed, fully meet its requirements, and furnish all information, including the views of this office, in regard to the question of bridging the Willamette River at Morrison street, in the city of Portland.

Very respectfully, your obedient servant,

H. G. WRIGHT,
Chief of Engineers, Brig. and Bvt. Maj. General.

Hon. ROBERT T. LINCOLN,
Secretary of War.

MAJOR G. L. GILLESPIE, CORPS OF ENGINEERS, TO THE CHIEF OF ENGINEERS.

UNITED STATES ENGINEER OFFICE,
Portland, Oregon, November 6, 1878.

GENERAL: I have the honor to inclose herewith, for the information of the Chief of Engineers, a certified copy of an act of the legislative assembly of the State of Oregon, approved October 18, 1878, giving the "Portland Bridge Company" a corporation duly incorporated under the laws of the State of Oregon, the right to connect Portland and East Portland, Oregon, by a bridge spanning the Willamette River on or above Morrison street, in the city of Portland. This street is the seventh street north (down-stream) of Columbia street, mentioned in the report of the board of engineers, dated November 27, 1872. The river front for a width of three streets, between Morrison and Clay (first street south of Columbia street) streets is the district devastated by the great fire of 1873.

Immediately after that disaster, for various reasons, the commercial interests of the district all gravitated to the lower part of the city, and it is there that the principal wharves have been located. Of late there has been a great demand for more shipping facilities, and in consequence wharves and shipping houses have been extended up-stream as far as Columbia street, with the prospect that they will go farther.

The prominent citizens with whom I have conversed are opposed to having a bridge across the river, except in the upper part of the city, stating that during high water, when the current is swift, shipping cannot be induced to go above the draw, on account of the trouble of getting back.

It will be remarked that nothing is said in the act relative to the general government, and I have been told that the framers assert their right to commence work at any time, under the power given them by the State of Oregon, claiming that the Willamette lies entirely within the State of Oregon, and therefore under the *sole jurisdiction of the State.*

I respectfully state that unless otherwise instructed by the department, I shall enjoin all work on the said bridge, commenced under the sole authority of the act of the legislature of the State of Oregon.

I am, general, very respectfully, your obedient servant,

G. L. GILLESPIE,
Major of Engineers, Bvt. Lieut. Col., U. S. A.

To the CHIEF OF ENGINEERS, U. S. A.

AN ACT to authorize the construction of a bridge on Willamette River, between the city of Portland and the city of East Portland, in Multnomah County, State of Oregon.

Be it enacted by the legislative assembly of the State of Oregon:

SECTION 1. That it shall be lawful for the "Portland Bridge Company" a corporation duly incorporated under and in conformity with the laws of the State of Oregon, or its assigns, and that said corporation or its assigns be, and are hereby, authorized and empowered to construct, build, and maintain, use or cause to be constructed, built, or maintained, or used, a bridge across the Willamette River, between Portland and East Portland, in Multnomah County, State of Oregon, for any or all purposes of travel or commerce, said bridge to be erected at any time within six years after the passage and approval of this act, at such point or location on the banks of said river, on or along any of the streets of either of said cities of Portland and East Portland as may be selected or determined on by said corporation or its assigns, on or above Morrison street, of said city of Portland, and "N" street of said city of East Portland, the same to be a lawful structure: *Provided*, That there shall be placed and maintained in said bridge a good and sufficient draw of not less than one hundred feet in the clear in width of a passage-way, and so constructed and maintained as not to injuriously impede and obstruct the free navigation of said river, but so as to allow the easy and reasonable passage of vessels through said bridge: *And provided*, That the approaches on the Portland side of said bridge shall conform to the present grade of Front street in said city of Portland.

SEC. 2. The said corporation or its assigns are hereby authorized and empowered to make such rules and regulations for the care, maintenance, and use of said bridge as it may deem to be just and reasonable; that the county court of Multnomah County is hereby authorized to fix, alter, and establish the rates from time to time of toll to be charged by such bridge corporation.

SEC. 3. That on the filing of the acceptance of the terms of this right by said corporation in the office of the secretary of state, signed by its president and attested by its secretary, and the entrance upon construction of said bridge in good faith by said corporation or its assigns, this shall be deemed a vested granted franchise.

SEC. 4. All acts, or parts of acts, either general or special, so far as they to any extent conflict with this act, are hereby repealed. Owing to the great necessity for the construction of the aforesaid bridge at the earliest practicable time this act shall be in force from and after its approval by the governor.

Approved October 18, 1878.

UNITED STATES OF AMERICA.

STATE OF OREGON,
Secretary's Office:

SALEM, *October* 30, 1878.

I, R. P. Earhart, secretary of the State of Oregon, do hereby certify that I am the custodian of the great seal of the State of Oregon. That the foregoing copy of an act to authorize the construction of a bridge across the Willamette River, &c., has been by me compared with the original "act" on file in this office, and said copy is a correct transcript therefrom, and of the whole of the said original act.

In witness whereof I have hereto set my hand and affixed the great seal of the State of Oregon, the day and year above written.

[SEAL OF THE STATE OF OREGON.]

R. P. EARHART,
Secretary of the State of Oregon.

THE CHIEF OF ENGINEERS TO MAJOR G. L. GILLESPIE, CORPS OF ENGINEERS.

OFFICE OF THE CHIEF OF ENGINEERS,
Washington, D. C., November 20, 1878.

SIR: Your letter of the 6th inst., transmitting a certified copy of the act of the legislative assembly of the State of Oregon, approved October 18, 1878, "to authorize the construction of a bridge on the Willamette River, between the city of Portland and the city of East Portland, in Multnomah County, State of Oregon," &c., has been received.

Should the construction of the bridge referred to be commenced, and it is ascertained that it will seriously obstruct or impair the navigation

of the Willamette River, it would be the duty of the parties interested to take measures for preventing it, and they failing the United States might then interfere, through the Department of Justice, for the protection of its interests. In this connection your attention is invited to circular of the Office of the Chief of Engineers, dated March 11, 1873, and especially to the opinion of the Attorney-General therein contained, entitled "Waukegan Breakwater, Harbor Improvements, Purpresture," from which the following extract is quoted for your guidance:

> As the property in the shores and beds of the navigable waters within the limits of the several States belongs to them, respectively, so the rents, issues, and profits arising from wharves, docks, or other structures erected for the facilities of navigation and commerce belong to them, and not to the United States. Moreover, the given State itself is, primarily, and to a superior degree, interested in the conservation of its navigable waters, which are among the elements of its particular prosperity and greatness. A nuisance to such waters is, therefore, generally speaking, of special injury to the particular State in which they lie. It has, therefore, its own power in the premises to vindicate its rights of property and of navigation against purpresture or nuisance. * * * But this power is in concurrence with and in subordination to the supreme *jus majestaticum* vested in the United States, who alone have power to prevent one State from exerting its power in this respect to the prejudice of another State. * * *
>
> Upon the whole matter my opinion is, then, that in case of a nuisance erected, or about to be erected, in the harbor of Waukegan, in the State of Illinois, and the facts being such as to call for the intervention of the Federal Government, it would be lawful and proper, in order to abate such nuisance, or to prevent, enjoin, and inhibit the same, for the Attorney-General to file an information in chancery before the competent court of the United States.

It appears, as will be seen from the above, that the initiative in proceedings to prevent the construction of the bridge in question should be taken by the citizens of the State interested, the power of the United States to be invoked only upon failure of the State authorities to abate the nuisance.

By command of Brigadier-General Humphreys:

Very respectfully, your obedient servant,

JOHN G. PARKE,
Major of Engineers.

Major G. L. GILLESPIE,
Corps of Engineers.

THE CHIEF OF ENGINEERS TO THE HONORABLE THE SECRETARY OF WAR.

OFFICE OF THE CHIEF OF ENGINEERS,
Washington, D. C., February 17, 1880.

SIR: I have the honor to return herewith Senate bill 372, Forty-sixth Congress, first session, which was referred to this office for report, and to invite attention to the following copy of the report and accompanying map * from Maj. G. L. Gillespie, Corps of Engineers, the officer in charge of the improvement of the Willamette River, to whom it was referred, which will afford the necessary information in regard to the proposed structure. Major Gillespie's views are concurred in by me, and it is suggested that no bridge should be constructed across the Willamette River at Portland until its plans and location have been approved by the Secretary of War, and that the bill be amended accordingly.

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*Map omitted.

It may be proper in this connection to invite attention to the previous acts relating to bridging the Willamette River at Portland, Oreg., found in Statutes at Large, vol. 16, page 64, and vol. 18, part 3, pages 281–'2.

[Second indorsement.]

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., January 31, 1880.

Respectfully returned to the Chief of Engineers.

As the bill is silent in regard to the kind of bridge proposed, and to its relation to high water in the Willamette, I am compelled in my report to confine my attention to the *location* alone.

The subject of bridging the Willamette River between Portland and East Portland, Oreg., was carefully investigated and reported upon by a Board of Engineers, under date of November 27, 1872. At that time the terms of the charter for the bridge company required that one end of the bridge should be located at the foot of Columbia street, Portland. In approving the location the board stated that the business of the city was tending down the river (north), and that it was not probable that many vessels, other than ordinary river boats, would find an inducement to pass above the site of the proposed bridge. In 1873 the southern part of the city was devastated by a great conflagration which destroyed nearly all the wharves south of Morrison street. This disaster gave a still greater impetus to the improvements already in progress in the northern district. In the last few years, however, the wharves destroyed by the fire of 1873 have been rebuilt, and extensive improvements are now being made farther up stream, which will, in time, make the southern as populous and valuable as the northern district.

Without a doubt a bridge at Morrison street would, in the present stage of the city's growth, be of great advantage to the local traffic between the two portions of the city separated by the river, but it would be so close to the most contracted part of the river on the city front where the greater part of the shipping lies, and the piers would form holding grounds for floating ice in the winter to such an extent that in my opinion a bridge at Morrison street would most seriously interfere with the navigation of the river and the commercial interests of the city. A not inconsiderable part of the commerce of the Willamette River Valley which is brought to the city in the river boats is landed at the wharves between Morrison and Columbia streets, and transferred thence to sea-going vessels, which during a high or even medium stage of water, would find a bridge a serious obstruction. The swift current during a high stage and the want of sufficient room for vessels to swing before entering the draw would prevent vessels going above the draw unless absolutely required to do so.

It is my opinion that the commercial interests of the city and river demand that any bridge which is to span the river should not be built *north* of Columbia street, and I would recommend that the bill, which is very general in its terms, be so modified as to require that the incorporators, before receiving authority to commence the construction, shall have the *location* and *plans* of said bridge approved by the honorable the Secretary of War, after a thorough examination by a Board of Engineers, as is usual in like cases.

G. L. GILLESPIE,
Major of Engineers, Bvt. Lieut. Col., U. S. A.

Very respectfully, your obedient servant,

H. G. WRIGHT,
Chief of Engineers, Brig. and Bvt. Maj. Gen.

Hon. ALEXANDER RAMSEY,
Secretary of War.

MESSRS. JOHN CATLIN, M. O. LOWNSDALE, AND OTHERS, TO MAJOR G. L. GILLESPIE, CORPS OF ENGINEERS.

PORTLAND, OREG., *October* 9, 1880.

SIR: The undersigned owners of real property in the city of Portland, Oreg. situated on the west bank of the Willamette River, south

of Morrison street in said city, respectfully call your attention, and that of the War Department, to the following:

The Willamette River in front of the shore property owned by the undersigned, and extending for almost a mile south of the line of the proposed bridge hereafter referred to, is navigable by the deepest ocean-going steam and sail vessels, and a large portion of the commerce of the port of Portland is carried on in the river in front of, and at the wharves on the west bank, and south of the location of said proposed bridge. And such property is valuable principally for wharves and docks for large ocean-going steam and sail vessels, and is the daily mooring place for such craft.

That a firm or corporation, styled the Pacific Bridge Company, has begun the construction of a pile roadway and bridge upon and over the Willamette River from Morrison street in Portland, to N street in East Portland, north of the wharves and docks of the undersigned, and which will intercept communication from their wharves and docks to the Columbia River and the ocean, by vessels navigating said river, excepting as they may be allowed to pass through draws constructed in the proposed bridge.

That the undersigned have been unable to obtain definite information of the plans of said bridge further than rumor that the roadway is to be built on piles, and the piers constructed of pile sheathing with stone filling.

That said bridge and roadway will prove a great and almost complete obstruction to the navigation of the river above or south of the same by large vessels, and will ruinously damage and destroy the commercial value of the dock and wharf property of the undersigned and other owners lying south of the proposed bridge.

The periodical freshets in the Willamette River create strong and variable currents and bring down large quantities of heavy drift, and there are seasons of dense fog, at which times the navigation of vessels through the proposed draw in the bridge would be difficult and dangerous.

The commercial interests of the place do not require the location of a bridge at these points, when it can be located and built elsewhere without interfering with navigation or commerce.

Your attention is respectfully called to the accompanying report on the matter of a bridge in the Willamette River, made to the Chief of Engineers, U. S. Army, in 1872.*

We respectfully ask for an inquiry on the part of the proper department of the government into the necessity for and the effect of such an obstruction in the navigation of the river as is contemplated in the proposed bridge and roadway.

We have the honor to remain, very respectfully, your obedient servants,

JOHN CATLIN,
M. O. LOWNSDALE,
W. K. SMITH,
J. H. JONES,
CHAS. HOLMAN,
And others.

To Col. G. L. GILLESPIE,
Major Corps of Engineers, U. S. A.

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* For report of Board of Engineers, see pages 37–40.

[First indorsement.]

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., October 12, 1880.

Respectfully forwarded to the Chief of Engineers with copy of reply to within communication inclosed.

The more considerable part of the commerce carried on by navigation of the Willamette River, at Portland, Oreg., is inter-State and foreign.

The river is subject to freshets, strong currents, much drift, and dense fogs.

The constructors of the bridge design it to be a low bridge, resting on piers, with a draw.

In the absence of Major Gillespie.

CHAS. F. POWELL,
First Lieutenant of Engineers.

LIEUTENANT CHARLES F. POWELL, CORPS OF ENGINEERS, TO MESSRS. JOHN CATLIN, M. O. LOWNSDALE, AND OTHERS.

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., October 11, 1880.

GENTLEMEN: In reply to your communication of the 9th inst., asking for an inquiry, on part of the proper department of the government, into the necessity for and the effect in the navigation of the river, of the proposed bridge and roadway referred to therein, I inclose a copy of indorsements on a United States Senate bill concerning this bridge, referred by the Chief of Engineers to Major G. L. Gillespie for report.

No notice has been received at this office of any action as recommended by Colonel Gillespie.

Very respectfully, your obedient servant,

CHAS. F. POWELL,
First Lieutenant of Engineers.

Messrs. JOHN CATLIN, M. O. LOWNSDALE, *and others.*

THE CHIEF OF ENGINEERS TO MAJOR G. L. GILLESPIE, CORPS OF ENGINEERS.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., October 28, 1880.

SIR: Acknowledging the receipt through your assistant, Lieut. C. F. Powell, Corps of Engineers, of the communication addressed to you on the 9th instant by John Catlin and others, property holders at Portland, in relation to a bridge in course of construction over the Willamette River at that city by the Pacific Bridge Company, with copy of Lieutenant Powell's reply thereto, your attention is called to the provisions of "An act to authorize the construction of a bridge over the Willamette River at Portland in the State of Oregon," approved June 23, 1874 (Statutes at Large, vol. 18, part 3, page 281), which is the only law known to this office giving authority for the construction of a bridge over the Willamette River at Portland; the act of February 2, 1870, having lapsed by its own terms.

It is presumed that the bridge referred to is being constructed under authority of the above-named law which provides that—

> Until the Secretary of War approve the plan and location of said bridge and notify the said corporation, association, or company of the same, the bridge shall not be built or commenced.

You will please give this matter your consideration, and if it be found that the bridge referred to in the letter of Mr. Catlin and others is being built without proper authority of law, or under the authority contained in the act above mentioned and in *violation of its provisions*, or to the detriment or damage of any navigation interests intrusted by law to the Secretary of War, viz, those contained in the appropriations for the improvement of the Willamette River, you will call the attention of the parties interested to the fact, and submit a statement of the case to this office to enable it to present the question to the Secretary of War for his action thereon.

Referring to your report of January 31, 1880, upon a bill to authorize the construction of a bridge across the Willamette River, and to the volume of acts passed during that session of Congress, it appears that this bill failed to become a law.

A pamphlet copy of laws of first session of Forty-third Congress, containing the act above referred to is herewith.

By command of Brigadier-General Wright.

Very respectfully, your obedient servant,

JOHN G. PARKE,
Lieut. Col. of Engineers, Bvt. Maj. Gen., U. S. A.

Major G. L. GILLESPIE,
Corps of Engineers.

MAJOR G. L. GILLESPIE, CORPS OF ENGINEERS, TO THE CHIEF OF ENGINEERS.

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., November 20, 1880.

GENERAL: I have the honor to acknowledge the receipt of department letter of October 28, 1880, relative to the bridge now constructing across the Willamette River at Portland, Oreg.

The bridge is building under the sole authority granted by an act of the legislature of the State of Oregon, October 18, 1878, a copy of which was transmitted to the department by letter from this office dated November 8, 1878. I respectfully invite attention to that letter, and especially to its last paragraph, in which I asked if I should not enjoin any work commenced by the company under the act in question. In answer to my letter, the department stated, under date of November 20, 1878, that the initiative in the proceedings to prevent the building of the bridge should be taken by the citizens of the State interested, the power of the United States to be invoked only upon failure of the State authorities to abate the nuisance.

The bridge contractors, for the incorporators under the State charter, conferred with me several times about this bridge, and I informed them every time of conference that the only safe way of preventing future embarrassment was to present plans, location, &c., of the said bridge for the examination and approval of the honorable the Secretary of War.

They claimed that the work must be done during low stage, and that if they suspended operations for such examination and approval—which they did not think necessary under their charter—they would lose the greater part of the favorable working season.

During my absence East, under orders, in October of this year, and after the adjournment of the State legislature of the State of Oregon, which has its sessions *biennially*, the bridge was commenced by the Willamette Iron Bridge Company, assignees of the Portland Bridge Company. The Pacific Bridge Company, referred to in the communication of Messrs. Catlin and others, dated October 9, 1880, are the contractors for the Willamette Iron Bridge Company.

In compliance with department instructions, conveyed by letter of October 28, 1880, I addressed, on the 9th instant, a letter to the Portland Bridge Company, copy herewith inclosed marked A, and received a reply thereto from the president, copy herewith inclosed marked B.

I addressed, on the 14th instant, a similar letter to the Willamette Iron Bridge Company, assignees of the Portland Bridge Company, a copy of the reply is herewith inclosed marked C.

The Board of Engineers in their report on the location and character of the bridge to be built under authority of the act of February 2, 1870, say (Chief of Engineer's Report, 1873, page 594):

> That the location of the double draw is judicious, and as each opening is 100 feet wide in the clear at low water, it is deemed ample for any vessels likely to pass through it.

I understand from the general tenor of the report that they refer chiefly to river-boats and not to sea-going vessels or steamers; indeed in the early part of the report (page 593) the following language is used:

> If the growth of the city should continue in this direction (north), *it is not probable that many vessels other than the ordinary river-boats, will find an inducement to pass above the site of the proposed bridge.*

And I infer from the reasoning which runs through the entire report that when the Board say, at the close, the bridge when completed "will not obstruct, impair, or injuriously modify the navigation of the Willamette River," they refer mainly to river navigation by small river-boats. The change of the location of the bridge from Columbia street, seven streets north to Morrison street, near the center of the business part of the city, will change somewhat the conditions of the problem. The number and sizes of vessels which will go above the bridge will increase, but I am not confident how far the jurisdiction of the General Government extends in securing accommodations for these vessels.

During last session of Congress, when the question of bridging the Willamette was before the Senate for consideration, a telegram from Washington, published in a daily paper, stated that the bill had been referred back to the Senate by the chairman of the Committee on Commerce, with the report that the General Government had no jurisdiction in the matter, and that in consequence no law was enacted in regard to it. I have since been informed that the same view is held by many distinguished Senators.

I send herewith a tracing* showing the general plan of the bridge. It has an iron pivot draw, with a pivot pier of masonry, rising from a foundation of timber and piles at low-water level. The span-piers are cylindrical iron tubes, 5 feet in diameter, filled with concrete, founded on piles at low-water level. The bottom of the lower chord is 8 feet

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* Tracing omitted.

above highest water. The draw gives an opening of 100 feet at low stage, in the clear, on each side of the pivot-pier. It will be manipulated by hand, and opened or closed inside of three minutes.

The highest water of the year at Portland occurs during the freshet in the Columbia River, June and July, when the water is backed up the Willamette River to a height of 28 feet above low water, at the Portland gauge. The Upper Willamette is then near its low stage. This rise produces no great current in the Willamette River, either at the maximum stage or during the recession of the freshet. The rise in the Willamette River at Portland, not exceeding 19 feet usually, due, however, to the rains and the melting of the snows in the Upper Willamette Valley, occurs in March or thereabouts, and is accompanied usually by a strong current. Local rains alone ordinarily cause another rise in the late autumn, but it seldom extends above 6 feet above low water. The times then at which the navigation of the Willamette River is especially affected by strong currents occur during the late autumn or early spring.

After a careful consideration of all the interests concerned, I am inclined to think that the commercial interests of the river may well concede the bridge to the city, but it is to be regretted at the same time that the projectors of the bridge did not advise more fully with the property holders south of Morrison street before they definitely arranged their bridge with a draw of so short a width as 100 feet in the clear. The water everywhere on the city front to the center of the channel is approximately 50 feet deep, and the government has never spent any money for the improvement or maintenance of the channel from Swan Island Bar, 2 miles below the city, to Clackamas Bar, 9 miles above, near Oregon City. The improvement in the Upper Willamette River, which includes Portland, heretofore made by the government, has been directed towards keeping the channel open for river boats only.

To this class, except when towing sea-going vessels, lashed to their sides, the bridge will form no serious detriment, and the draw will be ample for any purpose at any time. As the city increases in population and wealth, and the improvements projected by the Oregon Railway and Navigation Company are completed, the number of sea-going vessels which will go above the bridge will increase in equal ratio. Experience on other navigable waters teaches that, for a convenient and safe passage of vessels of this class, the opening should be 160 to 200 feet in the clear on either side of the pivot-pier.

I am informed that the parties interested in the wharves south of Morrison street, who feel themselves aggrieved by the construction of a bridge with so narrow a draw-opening, have brought suit against the bridge company in the State court, for the purpose of testing the validity of the charter. No suit has yet been brought in the United States court.

After conferring with the bridge projectors and examining theirplans, since the receipt of department letter of the 28th ultimo, I am satisfied that they have not attempted to do injustice to any property holders. Whilst claiming full power to build the bridge under the State charter, they positively assert that they have arranged their bridge in all its parts so as to meet all the essential requirements of the act of June 23, 1874, which authorized the Oregon and California and Oregon Central railroads to build a railroad bridge across the Willamette, at Portland, Oreg., and to the requirements for construction laid down by the Board of Engineers, in their report of November 29, 1872, after having

considered the plans presented by Mr. Caldwell, under authority of act of February 2, 1870, viz:

1st. The opening on each side of pivot pier is 100 feet wide in the clear at low water.

2d. The pivot pier of masonry is only 24 feet wide, and the others of iron tubes, in pairs, taking up only 5 feet in width of water-way, above low water.

3d. The foundation cribs of all piers are placed parallel to the current, and do not rise above low water.

4th. The lower chord of bridge is 17 feet above the level of highest water due to freshets in the Willamette, when the strong currents prevail, and 8 feet above level of the highest water due to back water from the Columbia.

The level of Front street, at the crossing of Morrison, where the bridge commences, is coincident, or nearly so, with the highest water, due to the Columbia backwater at that point, the reference of both being 28 feet above low water. If the lower chord is raised above the established level given under section 4, the slope of approach to the bridge level at abutment pier would, in the opinion of the builders, be prejudicial to the use of the bridge by heavily loaded wagons.

I send herewith copy of a letter addressed to me by the vice-president of the Oregon Railway and Navigation Company, accompanied by tracing,* marked D.

I am, general, very respectfully, your obedient servant,

G. L. GILLESPIE,
Major of Engineers, Bvt. Lieut. Col., U. S. A.

Brigadier-General H. G. WRIGHT,
Chief of Engineers, U. S. A.

A.

MAJOR G. L. GILLESPIE, CORPS OF ENGINEERS, TO THE PORTLAND BRIDGE COMPANY.

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., November 9, 1880.

SIR: The act of Congress approved June 23, 1874, giving authority for the construction of a bridge over the Willamette River at Portland provides that "until the Secretary of War approve the plan and location of said bridge and notify the corporation, association, or company of the same, the bridge shall not be built or commenced." This is the only law known to this office which gives authority for bridging the Willamette River at Portland. I have been informed by a letter, addressed to me by prominent citizens of this city under date of October 9, 1880, that you have "begun the construction of a pile roadway and bridge upon and over the Willamette River from Morrison street in Portland to 'N' street in East Portland;" that the roadway of said bridge is "to be built on piles and the piers constructed of pile sheathing with stone filling," and further that said bridge and roadway "will ruinously damage and destroy the commercial value of the dock and wharf property lying south of the proposed bridge."

I have the honor to request that you will inform this office of the special authority of law under which you have commenced the building of the bridge referred to, and that you will submit at once a full description of the proposed bridge, noting every particular of roadway, abutments, piers, material, and dimension for a full understanding of the structure in all its relations to the navigation of the river.

Very respectfully,

G. L. GILLESPIE,
Major of Engineers, Bvt. Lieut. Col., U. S. A.

PORTLAND BRIDGE COMPANY,
Portland, Oreg.

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* Tracing omitted.

B.

THE PORTLAND BRIDGE COMPANY TO MAJOR G. L. GILLESPIE, CORPS OF ENGINEERS.

OFFICE PORTLAND BRIDGE COMPANY,
Portland, November 12, 1880.

SIR: I have the honor to acknowledge the receipt of your letter of the 9th instant addressed to the "Portland Bridge Company," in which you refer to an act of Congress approved June 23, 1874, authorizing the construction of a bridge over the Willamette River at Portland, and quoting some of the provisions of the act.

You further state that you "have been informed by a letter addressed to you by a prominent citizen of the city," under date of October 9, 1880, from which you quote at some length, and then follows your official demand that the "Portland Bridge Company" inform your office of the special authority of law under which the bridge referred to has been commenced, and that the company submit to your office "at once" a full description of the proposed bridge, &c.

Permit me to say that you have been quite misinformed by the "prominent citizen" referred to, as to the fact that the Portland Bridge Company has begun the construction of a pile roadway and bridge over the Willamette River, at the point named, or any other point.

This company is not now engaged in building such a bridge as you now name, nor any other bridge over the Willamette River, nor does it propose to do so, nor has it done any work in the matter of building such a bridge, which would, in any way or manner, affect or interfere with the navigation of the river.

I suppose that this letter might close here, and your letter and request fully answered, so far as concerns this company, but out of personal regard for yourself, and with an especial declaration and understanding that the company does not recognize in you any official right or authority to demand the information asked for in your letter, if the company were in possession of it, or in possession to give it, I will say what work has heretofore been done, looking to the ultimate construction of a bridge across the Willamette River, has been done under the authority of an act of the legislative assembly of the State of Oregon, entitled "An act to authorize the construction of a bridge on the Willamette River, between the city of Portland and East Portland, in Multnomah County, State of Oregon," approved October 18, 1878.

That the Willamette Iron Bridge Company is the assignee of this company, that the latter named company, and not the Portland Bridge Company, is now engaged in the construction of a bridge across the Willamette River, at the point named in your letter, and they are prosecuting the work under the authority of the aforesaid act of the legislative assembly.

I have no doubt that upon request that company will promptly answer any communication you may address to it, touching its action in building the bridge with its location, plans, and specifications.

I have the honor to be your obedient servant,

WILLIAM BECK,
President of Portland Bridge Co.

Col. G. L. GILLESPIE,
Major of Engineers.

C.

GENERAL DESCRIPTION OF BRIDGE ACROSS THE WILLAMETTE RIVER CONNECTING THE CITIES OF PORTLAND AND EAST PORTLAND, STATE OF OREGON, NOW IN COURSE OF CONSTRUCTION.

Location.—The bridge is so located that its axis connects the points where the center line of Morrison street cuts the wharf line on the Portland side with the intersection of the center lines of Water street and "N" street on the East Portland side, which makes the axis almost exactly coincide with the prolonged center line of "N" street, and makes the axis as near as possible at right angles with the direction of the current of the river at this point.

Depth of River.—The river on the Portland side is very deep, the sounding showing depths of more than 60 feet below lowest low water at the wharf line foot of Morrison street and never less than 40 feet for the first 300 feet from the wharf line measured on the axis of the bridge. The rest of the bottom slopes gently and the low water is only about 4 feet above the bottom for a length of 600 feet from the East Portland side.

The highest high water is 28 feet 3 inches over the lowest low water, but this high water is back water, and the ordinary high water is only about 17 feet above lowest low water.

Length of Span.—Starting from the Portland side the bridge consists of: 1, an approach from Front street; 2, one Howe truss combination span; 3, one wrought iron draw span; 4, two Howe truss combination spans, and 5, a trestle approach to East Portland.

The first Howe truss combination span measures about 192 feet center to center of pier, measured on the axis of the bridge, the first pier not being at right angles to the axis.

The draw is 240 feet center to center of end piers. The next two Howe truss combination spans are each 180 feet center to center of piers, and the trestle approach consists of bents placed 30 feet apart.

Width of Bridge—The center lines of the trusses of the spans and draw are in a straight line 22 feet apart, center to center, leaving a clear roadway of 20 feet, which, on the East Portland side trestle, is widened out to 24 feet clear roadway on the down stream side of the bridge; outside of the trusses a sidewalk 6 feet wide in the clear is provided, except for the draw, where a sidewalk 4 feet wide in the clear is provided outside the trusses on both sides of the bridge so as to allow of the bridge being turned completely around either way, accommodating approbaching vessels.

Foundation.—The foundations are so-called pile foundations, consisting of piles driven as closely together as in any way possible, and afterwards cut off 2 feet below low-water line, capped with a heavy, double table on which the piers rest.

The number of piles in each pier is about 70, except in the draw pier where the number of piles is about 280.

To tie the piles together and also to prevent any washout between the piles, the whole pile foundation is surrounded by a crib constructed of 10″ x12″ timbers in layers above one another; the cribs have copartments filled with heavy loose rock so as to sink the cribs, and loose rock is also filled in all the empty spaces between the piles themselves as well as between the piles and the crib, and for further protection the outside of the cribs, at the bottom, are surrounded by riprap of loose rock. The cribs stop a foot below the tops of the piles so that the entire weight rests on the piles and none on the cribs.

Piers.—The tops of the piles are capped with two layers of heavy timbers, forming the tables upon which the piers rest. The draw pier is a stone pier with a shell of cut stone backed up with rubble masonry; the shape of this pier is that of a regular octagon, with an interior diameter of 24 feet, carried up entirely plumb.

The other piers are built of two columns of concrete or rubble masonry, placed under the center line of the trusses; surround each by a shell of one-fourth inch boiler-plate, and connected together by a solid wall of timber fitted well in between the two columns and bolted to these by means of two angle-irons running up and down the full height of the column; tie-rods $1\frac{7}{8}$ inches round also hold the columns together and prevent any spread, and, as a further way of bracing the two columns together, 3-inch planking is spiked diagonally in both directions to the wall of timber connecting the two columns. The columns have cut stone caps upon which the superstructure finds its bearing and so laid that the entire weight of the superstructure rests on the concrete, and no weight comes on the iron shell. The diameters of these cylindrical columns are 5 feet for the columns at the end of the draw-span, and 4 feet 6 inches for the rest of the columns.

Pier protection.—To protect the piers against drift a cluster of fifteen piles is driven in front of the stream piers (except for the draw pier), reaching up to high-water line and in front of the trestlebents on the East Portland side, every 60 feet a cluster of three piles is driven in a similar manner.

To protect the open draw against drift and vessels, and also to protect the vessels against the draw, a rest-pier is built up and down stream from the center of the draw and for a length equal more than half the length of the draw.

This rest-pier is built in such a manner that while it is strong enough to resist any impact from vessels, yet it is elastic enough to give so as not to cause any injury to striking vessels. The clear water-way from this rest-pier is 100 feet at low-water line, and 102 feet further up.

Depth of channel.—The channel of the western opening of the draw varies in depth from 40 feet to 52 feet, being nowhere less than 40 feet, and the channel of the eastern opening has a depth varying from 35 feet to about 20 feet; both having a clear water-way of 100 feet.

Superstructure.—The superstructure of the three stream-spans consists of Howe Truss Combination Bridge. The trusses being Howe trusses, with iron or steel bottom chords, iron truss-rods, and wooden top-chords, braces, and counter-braces. The heights of the trusses are 24 feet center to center of chords, and the floor system is suspended by means of wrought-iron floor-beams hangers from the pins of the bottom chord.

Draw-span—The draw-span is constructed entirely of iron with the exception of the

floor-joists and floor planking. It is constructed so as to be entirely center-bearing in order to give the resistance to turning as small a lever as possible, for which purpose also the center-pin is made of hard steel, that its size may be reduced as much as possible. The draw is so adjusted that when it is unloaded, or, more correctly speaking, only loaded with its own weight, it will not bear on its end bearings, but just touch them, thus securing ease in starting the draw; and as the temperature may have more influence on the top chord than on the bottom chord, from the reason of the bottom chord-pins, protected against the direct influence of the rays of the sun (by the floor planking), the tendency might be, in very warm weather, for the draw to bear too heavy on its end bearings when the top chord expands, a further vertical adjustment of the end bearings is provided.

The gearing and the mechanical arrangements of these different adjustments are so designed, that under any conditions of wind and temperature it will not require more than three minutes to open and close the draw.

Accompanying is a general plan of the bridge, showing ground plan and elevation. The scale is 1 inch=20 feet; but drawing is not exact to scale, and where figures are shown, these are correct.

PRESENT CONDITION OF WORK.

The cribs for the foundations of all the piers are completed and sunk in position, and, with one exception, are filled with rock. All the foundation piles are driven, and sawed off below low water line. The tables for the columns are all on over the piles, with one exception. The mason work for the draw foundation above low water is about to commence.

WILLAMETTE IRON BRIDGE COMPANY,
By WILLIAM BECK, *President.*

D.

THE OREGON RAILWAY AND NAVIGATION COMPANY TO MAJOR G. L. GILLESPIE, CORPS OF ENGINEERS.

OREGON RAILWAY AND NAVIGATION COMPANY,
PORTLAND, *Oreg., November* 16, 1880.

DEAR SIR: I beg leave to submit herewith for your consideration a tracing* of the river front at the city of Portland, upon the west side of the Willamette River, showing the location of the streets of said city, and of the proposed bridge across that river at Morrison street, together with the location and proposed improvements at the terminus of the Oregon Railway and Navigation Company's lines in said city.

It will appear from this tracing that it is proposed by the company now engaged in constructing the bridge to build the same at about the center of the city front and thus create an obstruction to the shipping of the city on at least one-half of its river front.

The Oregon Railway and Navigation Company, as you are aware, is engaged in constructing a railroad from The Dalles, in Wasco County, to city of Portland, which is intended to cross the Willamette River above the city of Portland, upon the north end of what is known as Ross Island, as indicated upon the tracing herewith submitted. This company has also purchased the tract of land, inclosed in red lines on the tracing, and intends to improve its property (as shown), by constructing six slips with piers sufficient to accommodate the largest ships that can reach the city of Portland. The company has nearly completed a line of railroad from The Dalles to Wallula, in Walla Walla County, which there connects with the Walla Walla and Columbia River Railroad, and with other branch railroads of said Oregon Railway and Navigation Company now being projected, or in process of construction.

When this road is completed, which it certainly will be within the next eighteen months, more grain will be shipped over its roads and from the city of Portland at the slips and piers of the above referred-to company than will be shipped from all other parts of the city of Portland, and, in fact, from the whole State. Besides this, many sea-going vessels at the present time discharge and receive cargoes above the site of the proposed bridge. The water along the whole line of the company's property, as well as between the site of the proposed bridge and the company's terminal grounds, is of sufficient depth to float any vessel which can reach the city at any stage of water, and is substantially of the same depth as below the site of the proposed bridge.

I am informed by many persons acquainted with the navigation of the Willamette

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*Tracing omitted.

River, and in fact by all such who have expressed an opinion, that the proposed bridge will prove to be, at all seasons of the year, a serious obstruction to the navigation of the river, and, at times of high water, so serious as to prevent the passage of sea-going vessels, at least without great danger. The draw is said to be entirely insufficient, being, as I am informed, only 100 feet in width, whereas, I am told, in the Upper Mississippi, where navigation is confined exclusively to river-boats, nothing less than a 180-foot draw is permitted. The bridge is also being constructed entirely too low, the lower chords, as I am informed, being but little, if any, elevated above extreme high-water mark.

Commerce would seem to demand that no bridge should be constructed below that portion of the city front designed by said Oregon Railway and Navigation Company for the terminus of its road; certainly no bridge without a sufficient draw to allow of safe and convenient navigation of the river at all stages of water by sea-going vessels.

Respectfully, yours,

T. F. OAKES,
Vice-President.

Col. G. L. GILLESPIE,
Corps of Engineers, U. S. A.

THE OWNERS OF THE STEAMER A. A. M'CULLY, TO MAJOR G. L. GILLESPIE, CORPS OF ENGINEERS.

PORTLAND, OREG., *November* 19, 1880.

SIR: In regard to the bridge now being constructed across the Willamette River, we wish to make the following statement:

We hereby certify that we are the sole owners of the steamer A. A. McCully, now engaged in navigating the Willamette and Columbia rivers; that we have moved ships through the space between the piers, where the draw is intended to be located in the proposed bridge, and find it extremely dangerous, even when the river is without any current. During the winter months when there are strong currents, tug-boat and ship owners will not risk their property by attempting to make the passage.

A pier is being placed immediately in the center of the channel, which is none too wide for ships and boats, when not obstructed, as the deep water channel is very narrow.

However, in justice to owners of dock and warehouse property in the southern portion of the city, as well as to those who are owners of shipping and boats, and engaged in the navigation of said river, we would most respectfully petition and pray *that this statement of facts* be placed before the proper authorities for their consideration, and immediate steps taken to have this nuisance removed.

Z. J. HATCH,
Two-third owner Steamer A. A. McCully.
P. B. SANBURN,
One-third owner and Captain of Steamer A. A. McCully.

Col. G. L. GILLESPIE,
Major of Engineers, U. S. A.

TELEGRAM.—THE WILLAMETTE IRON BRIDGE COMPANY TO THE HON. THE SECRETARY OF WAR.

PORTLAND, OREG., *November* 30, 1880.

Measures reported to be on foot to induce your office to prevent completion of bridge across Willamette River, now building here. All piers already completed. We have to respectfully ask that you notify us if any such thing is being done, that we may be heard by you before any action is taken.

WILLAMETTE IRON BRIDGE CO.
WM. BECK, *President.*

The Hon. SECRETARY OF WAR.

THE CHIEF OF ENGINEERS TO THE HON. THE SECRETARY OF WAR.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., December 1, 1880.

SIR: I have the honor to return herewith the telegram of the Willamette Bridge Company requesting information concerning a bridge in course of construction across the Willamette River at Portland, Oreg., referred to this office for special report, and to say that, under date October 12 last, Lieut. Charles F. Powell, Corps of Engineers, in the absence of Major Gillespie, the officer in charge of the improvement of the Willamette River, forwarded to this office a protest of certain citizens of Portland against the erection of a bridge over the river at that place by the Pacific Bridge Company (supposed to be the same referred to in the telegram under consideration), with copy of his reply thereto, which are herewith submitted, together with copy of the reply of this office to Major Gillespie in relation to the matter. It is probable that the request made in the telegram of the Willamette Bridge Company for information as to measures reported to be on foot to prevent the construction of the bridge has reference to the above correspondence. There is no other information on the subject in this office.

In this connection it may be proper to state, however, that "A bill (Senate 372) authorizing the construction of a bridge across the Willamette River at Portland, Oregon," was reported upon by this office during the last session of Congress, and that it failed to become a law. The report thereon is herewith.

Very respectfully, your obedient servant,

H. G. WRIGHT,
Chief of Engineers, Big. and Bvt. Maj. Gen.

Hon. ALEXANDER RAMSEY,
Secretary of War.

THE HON. THE SECRETARY OF WAR TO THE WILLAMETTE IRON BRIDGE COMPANY.

WAR DEPARTMENT,
Washington City, Decémber 4, 1880.

SIR: I duly received your telegram of the 30th ultimo, making inquiry as to the truth of the report that efforts are being made to induce the War Department to prevent the completion of the bridge across the Willamette River at Portland, Oreg., and beg to inform you, in reply, that Major Gillespie, Corps of Engineers, has been instructed to inquire into this subject, he being the officer nearest the ground, and having charge of the public improvements in Oregon, and who will convey to you such information as may be proper.

Very respectfully,

ALEX. RAMSEY,
Secretary of War.

WM. BECK, Esq.,
President Willamette Iron Bridge Company,
Portland, Oregon.

PROTEST OF THE OREGON RAILWAY AND NAVIGATION COMPANY.

OFFICE OREGON RAILWAY AND NAVIGATION COMPANY,
20 *Nassau Street, New York, December* 1, 1880.

SIR: Your petitioner and protestant, The Oregon Railway and Navigation Company, respectfully represents that it is a corporation duly incorporated under the general incorporation laws of the State of Oregon, with large, active capital, incorporated, among other things, for the purpose of navigating the waters of the Pacific Ocean between San Francisco, Cal., and the mouths of the Columbia River, and the waters of the Columbia River and Willamette River to Portland, Oreg., with large ocean steamers; and also the waters of the Columbia and Willamette rivers and their tributaries with river steamers and other water craft. And your petitioner is now actively engaged in the navigation of all such waters as aforesaid, employing therein four ocean steamers and twenty-five river steamers, all of which, except eight river steamers, sail to and from the city of Portland.

Your petitioner is also incorporated for the purpose of building railroads, and is now engaged in constructing a railroad from Walla Walla County, Washington Territory, to Portland, in the State of Oregon. That portion between the Dalles and Wallula, Wash., is now nearly completed, connecting with the Columbia River Railroad and with other branch railroads of the Oregon Railway and Navigation Company now being projected or in process of construction.

When this railroad is completed to Portland, as it is expected it will be within a year or eighteen months, it is the intention of this company to cross the Willamette River into the city of Portland at "Ross Island," in said river, as indicated on the map filed herewith, marked *Exhibit* A, and made part hereof. This company has also purchased the tract of land inclosed in red lines on the map aforesaid, and intends to improve its property by the construction of six slips, with piers sufficient to accommodate the largest ships that can reach the city of Portland. When this railroad is completed to this point, as now projected and under construction, more grain will be shipped over its roads and from the city of Portland at the slips and piers of this company, as aforesaid, than will be shipped from all other parts of the whole State of Oregon. That this company, for the reasons stated, is largely interested in the freedom of the waters of the Willamette River from all artificial obstructions to their navigation, hence begs to bring to the attention of your department the fact that certain persons are now engaged, and for some time past have been engaged, in driving piles and doing other work towards the construction of a bridge across the Willamette River at a point opposite the foot of Morrison street, as designated on the map aforesaid, herewith filed.

That such location, it will be observed, is about the center of the city front, and at such a point as to necessarily create a most serious obstruction to the shipping of the city on at least one-half of its river front.

The site of the proposed bridge, and where piles are now being driven, is designated on the map A, hereto attached, by the following words: "Morrison street where piles are being driven." That at said point in the Willamette River the tide ebbs and flows. That said persons, or company so engaged in the construction of said bridge, are proceeding without any license or authority whatever from either the Congress of the United States, the War Department, or other competent authority.

That the construction of a bridge at the point designated would seriously interfere with the navigation of said river, and the commercial interests of the city of Portland, the State of Oregon, and the commerce of the Pacific Ocean, centering there as well. During the past two years large shipping facilities, in the way of wharves, warehouses, roadways, &c., &c., have been erected along the Portland City front south of Morrison street (the site of the proposed bridge), and a very large proportion of the commerce of said river, and of the city of Portland, is now transferred to that portion of said river lying south of Morrison street, and all of which will be seriously and permanently affected by the construction of *any* bridge at Morrison street; no matter how carefully provided with draws such proposed bridge will, in the judgment of this company and of those interested in the navigation of said river, and the commerce of said port, prove to be at all seasons of the year a serious obstruction to its navigation, affecting materially and adversely its shipping both above and below the proposed bridge.

And at times of high water this obstruction will be so serious as to prevent the passage of sea-going vessels, at least without great danger. The current of the river at and above the site of the proposed bridge in times of high water is unusually swift, this, together with the want of room to enable vessels to swing before entering the draw, would constitute a bridge at that point as little else than an impossible barrier to navigation above it by ocean vessels, while again the piers at this point would, during the winter, form obstructions to floating ice to such an extent as to seriously affect the shipping both above and below the bridge.

Herewith attached, marked Exhibit B, and made part hereof, please find copies of correspondence* bearing upon this subject.

To the copy of communication of Col. G. L. Gillespie, Major of Engineers, U. S. A., dated United States Engineer's Office, Portland, Oreg., January 31, A. D. 1880, we invite your *special* attention, and fully concur in all its statements as to great detriment to the navigation of said river that would be occasioned by the construction of *any* bridge at such point. Were it at all possible to construct a bridge across said river at such point, without remediless injury to its navigation and the commercial interests of the port, and it is not, then every *possible* facility in aid of such navigation should be provided in the construction of the bridge, and this is not being done, as we are advised, in the bridge under construction. The contemplated draw in the proposed bridge is, as we are advised, only 100 feet in width, whereas in the Upper Mississippi, where navigation is confined to river boats, nothing less than 180 feet draw is permitted. In *any* event the proposed draw of 100 feet is wholly insufficient.

Again, the bridge is being constructed entirely too low, the lower cords, as we are informed, being but little, if any, above extreme high-water mark.

For the reasons stated, therefore, and in view of the power vested in your department, and in further consideration that ships of commerce from nearly every port in the world ascend the Willamette River to docks above the site of the proposed bridge, the Oregon Railway and Navigation Company, in behalf of its own important interests,

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*NOTE.—The correspondence referred to is letter of Capt. Chas. F. Powell, of October 11, 1880, to Messrs. John Catlin, M. O. Lownsdale, and others, which may be found on page 1, and indorsement of Maj. G. L. Gillespie, dated January 31, 1880, which is quoted in letter of the Chief of Engineers to the Hon. the Secretary of War, of February 17, 1880. (See page 5.)

EXTRACT FROM

MAP

OF THE CITIES OF

PORTLAND

AND

EAST PORTLAND

AND THE TOWN OF

ALBINA

OREGON

COMPILED AND PUBLISHED BY

W.S.CHAPMAN

SCALE OF FEET

Red lines are boundaries of O. R. & N. Property
Blue lines are tracks leading to buildings, slips &c.

SEN. EX. DOC. No. 162, 1st SESS., 47th CONG.

and of the general interests of the navigation of said river, and the commerce of said port, respectfully, but earnestly, protests against the construction of *any* character of bridge across the Willamette River at the point designated; and inasmuch as the piles now being driven in said river at such point are now an obstruction to the navigation of said river, we respectfully ask that your department take such steps as may be proper and necessary to prevent further obstructions, and for the speedy removal of the obstruction already created.

By order of the company:

H. VILLARD,
President.

To Hon. ALEX. RAMSEY,
Secretary of War.

[First indorsement.]

Respectfully referred to the Chief of Engineers, to cause report upon this matter to be made by Major Gillespie, returning these papers with his report.

By order of the Secretary of War:

H. T. CROSBY,
Chief Clerk.

DECEMBER 8, 1880.

[Second indorsement.]

OFFICE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
December 9, 1880.

Respectfully referred to Maj. G. L. Gillespie, Corps of Engineers, for report, as directed in the foregoing indorsement of the Secretary of War.

To be returned.

By command of Brigadier-General Wright:

JOHN G. PARKE,
Lieut. Col. of Engineers, Bvt. Maj. Gen., U. S. A.

[Third indorsement.]

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., December 29, 1880.

Respectfully returned to the Chief of Engineers, United States Army, with report of this date.

G. L. GILLESPIE,
Major of Engineers, Bvt. Lieut. Col., U. S. A.

[Fourth indorsement.]

OFFICE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
January 17, 1881.

Respectfully returned to the honorable the Secretary of War, with report of Maj. G. L. Gillespie, made in obedience to his instructions of the 8th December last, as contained in first indorsement.

H. G. WRIGHT,
Chief of Engineers, Brig. and Bvt. Maj. Gen.

[Fifth indorsement.]

Respectfully returned to the Chief of Engineers for an expression of his opinion as to whether he approves of the views taken by Major Gillespie, and whether the Attorney-General should be requested to direct the proper United States district attorney to preserve the interests of the United States.

By order of the Secretary of War:

H. T. CROSBY,
Chief Clerk.

WAR DEPARTMENT,
January 19, 1881.

REPORT OF MAJ. G. L. GILLESPIE, CORPS OF ENGINEERS, OF DECEMBER 29, 1880.

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., December 29, 1880.

GENERAL: I have the honor to acknowledge the receipt of the protest of the Oregon Railway and Navigation Company, dated December 1, 1880, against the construction of the bridge across the Willamette River at Portland, Oreg, addressed to the honorable the Secretary of War, and transmitted, for report, to me by indorsement from the Engineer Department, December 9, 1880. I made a full and detailed report on the subject of this bridge to the department, under date of November 20, 1880, to which I would respectfully refer you; and I do not know that much additional information can be given. When the legislature of Oregon granted the charter for a bridge at Morrison street, October 18, 1878, I was of the opinion that the higher jurisdiction of the general government relative to plan, location, &c., of the bridge, and their effect upon the navigation of the river, should be respected before work was commenced, and expressed to the department, November 6, 1878, my intention of enjoining any construction made under the sole authority of the State of Oregon. On the 8th of April, 1879, Senator Grover introduced a bill in the Senate of the United States, which was read twice and referred to the Committee on Commerce (S. B. 372, Forty-sixth Congress), authorizing the construction of a bridge across the Willamette River, at Portland, Oreg. This bill was referred to me for report.

It was silent in regard to the kind of bridge proposed to be built, but designated Morrison street as the site.

My report, dated January 31, 1880, took strong grounds against the bridge at Morrison street, the main objections being based upon the narrowness of the river, the strength of the currents at high stage, and injury to the wharves immediately south of the bridge.

In my last report, dated November 20, 1880, the plans of the bridge itself, irrespective of the site, are discussed, and it is stated that the previous plans, which have received the approval of the Board of Engineers, were, in my opinion, for a bridge intended to accommodate river boats only, and that for sea-going vessels, which will in the future go to wharves south of Morrison street, the draw in the bridge should have spaces 160 to 200 feet wide in the clear on each side of the pivot pier.

Portland and East Portland, on opposite sides of the river, are grow-

ing rapidly, and will continue to grow with equal pace with the development of the country, by the introduction of foreign capital and the consequent increase of shipping, and it is natural that they should demand a bridge across the Willamette to give them a freer, better, and more certain intercommunication than by the steam ferries. It is also natural that the shipping interests of the sea and the river should conflict with the non-commercial interests; such conflicts, in the past, have been reconciled by each party yielding a portion of its demands, resulting in the construction of a bridge which should interfere in the least possible degree with navigation.

With these impressions in my mind, I stated in my last report that "the commercial interests of the river may well concede the bridge to the city," but I did not give my approval to a bridge at Morrison street, for I have held all the while, and still hold, that Columbia street is the place where it will interfere least with the navigation of the river. I have also stated in my report of November 20, 1880, that the currents of the Willamette River reached their maximum in the late autumn and early spring. I might have added that this is the most active period of the year for shipping. The wheat and other products of the Willamette Valley are at that time gathered and ready for market, and all the river boats are employed to their fullest capacity in bringing them where they can be loaded into sea-going vessels. As the bridge at Morrison street was commenced under a State charter granted over two years ago, with which the free discussions of the plans of the incorporators by the daily press of the city made every one familiar, and as the interested parties gave an apparent sanction to the adopted site by delaying action to prevent construction until after the foundation for the several piers were sunk in position, I did not in my last report repeat the objections I had previously reported as belonging to that site.

The more I reflect upon this subject the more unfortunate I find the site of the proposed bridge, and the more necessary it appears that the draw-openings should be enlarged. The river currents, which are very swift during the stages which prevail at the time vessels most desire to reach the .southern wharves, after passing Morrison street, trend gradually towards the concave bank on the east side, forming on the west side a strong eddy, which sets back from A street south, towards Stark or Washington. This eddy is well known to pilots, and allowances are made for it in navigating the river. Whenthe effect of hte current is supplemented by that of the winds, which sometimes blow with great violence down the valley between the two great ranges mountains, the passage by large steamships or sailing vessels under tow, through draw-openings only 100 feet wide in the clear, will necessarily be attended with great danger. The least admissible clear opening is 160 feet.

I suggested such an increase to the contractors immediately on my return from the East when the discontent of ship-owners had begun to be expressed, but the foundations were in for draw-openings of 105 feet, and the suggestion was not acted upon because of the expense attending its adoption. The construction of the Oregonian Railway (narrow gauge) from Dayton to Portland will add another important interest south of Morrison street. This company intends to occupy the public levee (see chart of city with Oregon Railway and Navigation Company's protest) or some block near it, for depot and other railroad purposes, and propose to build large wharves near Columbia street for handling all freight received and shipped by that railroad.

I am not aware that any detailed and careful survey has ever be made of the river along the city from bank to bank to ascertain t absolute depth of water at the several points, or any connected seri of observations to determine the direction and velocities of the curren at the varying stages.

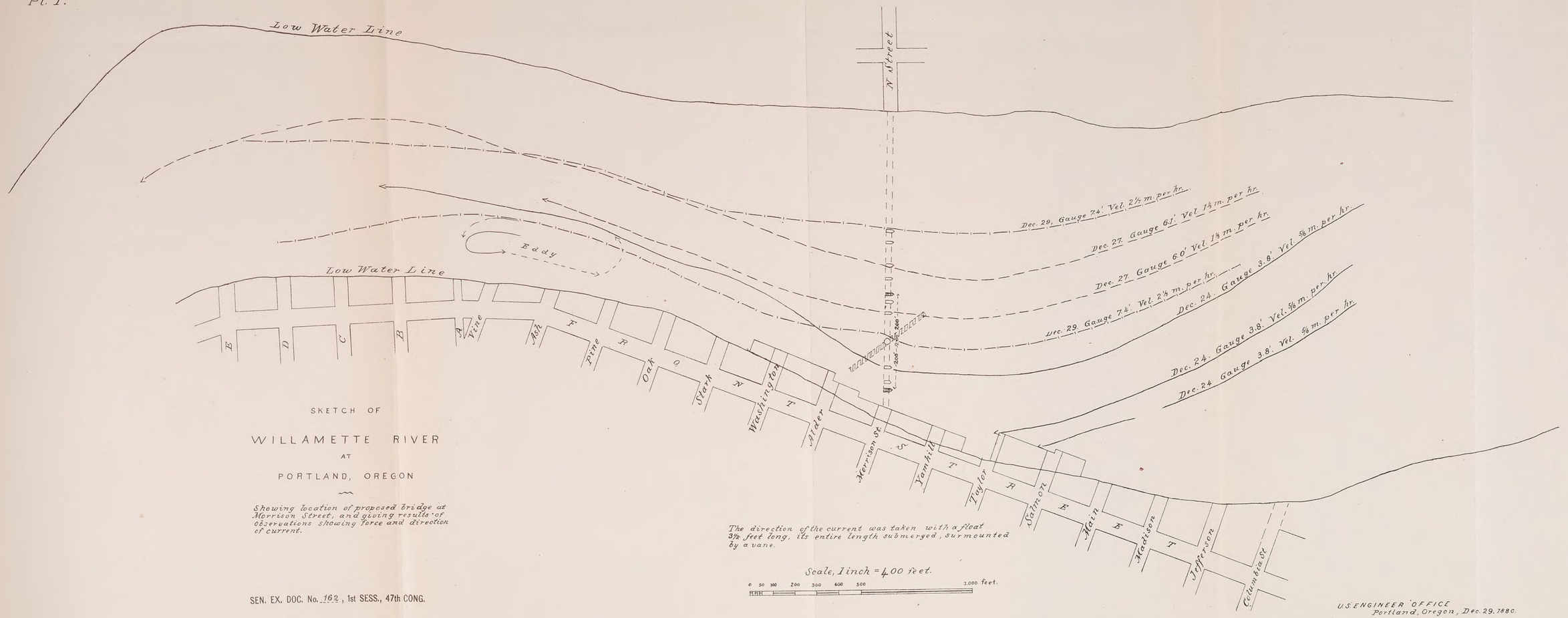
It may be stated, however, that the width at Columbia street is 1,8 feet; at Morrison street 1,400 feet; at A street 1,000 feet; and from toJ streets only 800 feet, below which latter street it gradually widen agin. Along the whole front for a distance of 200 feet from dhe le bank the depth varies from 40 to 70 feet at low water, the deepes water being at the gorge; and it has been estimated that the velocity of the current at the highest stages reaches 6 to 7 miles per hour; though it is not believed that the velocity at the average high stage exceeds 3 to 4 miles per hour.

These estimates for velocity, it is presumed, take account of the tidal influences which are appreciable at Portland. The rise due to highest spring tides is 3 feet, approximately, and when strong *south*-westerly winds blow for several days consecutively at the mouth of the Columbia River, the tides which have advanced up the river become imprisoned, and their augmentation by succeeding tides raises at such times the water level at Portland to a height as great as 5 feet above zero of gauge.

It is to be remarked that the deep-water channel between Columbia and Stark streets follows closely the left bank. From the wharf at Morrison street, for a distance of 200 feet along the line of the proposed bridge, the water is uniformly 50 feet deep at low stage; the bed from this point begins to rise under an angle of one-tenth and at a farther distance of 250 feet, the 23-foot curve is reached. The deep-water channel for sea-going vessels is then practically 450 feet wide at low stage. According to the plans by which the bridge is being built, the west abutment pier of the draw stands on the west side of the *deepest* section of the channel, and the main channel is closed by the inshore span. It will not be practicable to make the west draw-opening embrace or cover the whole of the main channel, without materially damaging one hundred or more feet of the dock front on either side of the bridge, but by enlarging the draw-opening to 200 feet by placing the west abutment pier 100 feet nearer the wharf, the obstructions to navigation by the proposed construction will be much abridged. The *profile* of the river's bed, given by the contractor's drawing, indicated such shoal water in the east draw-opening that I felt compelled to have soundings taken. I also took occasion to have some observations made to ascertain force and direction of the currents. The results are shown on the accompanying tracing. The contractors made no observations of any kind before commencing their bridge, and located their foundation cribs for piers by making them at right angles with the line of the bridge—the observed direction of the currents determined by my limited observations, in very bad weather, seem to indicate that the faces of the cribs are almost parallel with the current at the higher stages of the river.

Vessels at the wharves south of Morrison street when desiring to use the draw will either drop down astern, under tow, or go up stream, swing, and come down bow on. The former is the more natural way, and will probably be followed when the inshore current is slight. When the current is strong, all vessels will draw out into the stream and swing, and then right themselves in the main current before entering.

Pl. I.



SKETCH OF

WILLAMETTE RIVER

AT

PORTLAND, OREGON

Showing location of proposed bridge at Morrison Street, and giving results of observations showing force and direction of current.

SEN. EX. DOC. No. 162, 1st SESS., 47th CONG.

The direction of the current was taken with a float 3½ feet long, its entire length submerged, surmounted by a vane.

Scale, 1 inch = 400 feet.

0 50 100 200 300 400 500 1,000 feet.

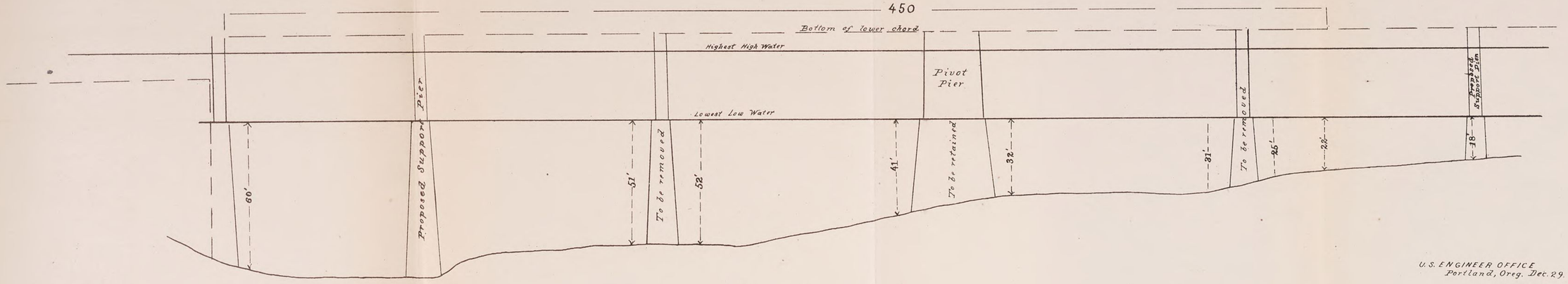
U.S. ENGINEER OFFICE
Portland, Oregon, Dec. 29, 1880.

Forwarded to the Chief of Engrs. U.S.A. with report of this date

G. L. Gillespie
Major of Engrs, Bvt. Lt. Col., U.S.A.

Pl. II.

SKETCH Showing Depths in Willamette River along the line of the Proposed Bridge at Morrison Street, and the modifications to be made to existing plans to enlarge the draw openings from 105 feet in the clear to 200 feet in the clear.



Scale 1 inch = 40 feet.

0 5 10 20 30 40 50 100 ft.

U.S. ENGINEER OFFICE
Portland, Oreg. Dec. 29, 1880

G. L. Gillespie

Major of Engrs, Bvt. Lt. Col. U.S.A.

Forwarded to the Chief of Engineers with report of this date.

SEN. EX. DOC. No. 162, 1st SESS., 47th CONG.

On the 20th instant, a sailing vessel under tow by a river boat, whilst attempting to drift down astern between the Morrison street wharf and the west abutment pier of draw, at the time a boat was lying at that wharf, collided with the abutment pier, and knocked off into the river its two iron columns. It is difficult to determine whether the collision was intentional or unavoidable. The pilot says that when he came within 20 feet of the boat he found that the currents were setting him in against the wharf, and to avoid striking the boat he gave a few turns ahead—at that moment a "flaw" of wind burst down Morrison street, and the currents, striking the vessel on the starboard side, his boat was carried down stream almost broadside, with the result as stated. In the minds of ship-owners, this accident is but the forerunner of others which will happen under similar circumstances, when the bridge is built.

I have given the subject a very careful consideration, and have arrived at the following conclusions:

1. The deep-water channel is only 450 feet wide at low stage for sea-going steamers and vessels of deep draught, and any bridge across the Willamette River at Portland which will materially diminish this width, will seriously interfere with the navigation of the river.

2. The draw openings on either side of the pivot pier should be 200 feet in the clear.

3. No individual or corporation should be allowed to obstruct the channel by building a bridge with draw-openings only 105 feet wide in the clear. The adoption of such widths will cause frequent losses to shipping, and may result in preventing sea-going vessels from going above the bridge.

4. The builders of the proposed bridge at Morrison street, should be compelled to enlarge the draw-openings to 200 feet in the clear as indicated

5. The bridge should have been located at Columbia street, and not at Morrison street.

I am, general, very respectfully, your obedient servant,

G. L. GILLESPIE,
Major of Engineers, Bvt. Lt. Col., U. S. A.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

THE CHIEF OF ENGINEERS TO THE HON. THE SECRETARY OF WAR

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., January 22, 1881.

SIR: I have the honor to return herewith the protest of the Oregon Railway and Navigation Company against the construction of a bridge over the Willamette River at Portland, Oreg., and the report thereon of Maj. G. L. Gillespie, Corps of Engineers, which were returned to this office by indorsement of the 19th instant, for expression of opinion as to whether "the views taken by Major Gillespie" are approved, and "whether the Attorney-General should be requested to direct the proper United States district attorney to preserve the interests of the United States," and to reply as follows:

The only law known to this office for the construction of a bridge

over the Willamette River at Portland is that contained in the act entitled "An act to authorize the construction of a bridge over the Willamette River at Portland, in the State of Oregon," approved June 23, 1874 (United States Statutes at Large, volume 18, part 3, page 281, chapter 482), which provides:

> That the said bridge shall be so constructed and built as not to obstruct, impair, or injuriously affect the navigation of the river; and in order to secure a compliance with these conditions, the corporation, association, or company proposing to erect the same, previous to commencing the construction of the bridge, shall submit to the Secretary of War a plan of the bridge, with a detailed map of the river at the proposed site of the bridge, and for a distance of a mile above and below the site, exhibiting the depths and currents at all points of the same, together with all other information touching said bridge and river as may be deemed requisite by the Secretary of War to determine whether the said bridge when built will conform to the prescribed conditions of the act not to obstruct, impair, or injuriously affect the navigation of the river: *Provided, further,* That the Secretary of War may detail an officer to superintend the survey and examination of said river, with a view to said location.

It further provides that—

> Until the Secretary of War approve the plan and location of said bridge and notify the said corporation, association, or company of the same, the bridge shall not be built or commenced.

The bridge authorized by the above act has not as yet been constructed, but it will be seen that Congress was more than ordinarily careful in the preparation of the act, in order that the interests of navigation and commerce should be fully cared for.

The bridge now under consideration, alleged to have been authorized by State authority, is represented as being constructed in violation of the interests of commerce and navigation, and in the face of protests from interested parties whose rights are being infringed upon. Major Gillespie has given the subject thoughtful consideration, and his views are concurred in.

In view of the fact that Congress has, by the above quoted act, assumed control and jurisdiction over the navigation of the Willamette River, at Portland, and over the river generally, in other acts, by the appropriation of funds and the construction of works for its improvement, and has imposed certain duties upon the Secretary of War in connection therewith, it would seem right and proper that the War Department should intervene for the protection and preservation of the navigable waters of the United States, in the interests of commerce and navigation in this connection. It is, therefore, recommended that the proper United States district attorney be instructed to take the matter in hand, with a view to the protection of the rights of the United States in the preservation of its navigable waters, conferring with Major Gillespie in the matter.

Very respectfully, your obedient servant,

H. G. WRIGHT,
Chief of Engineers, Brig. and Bvt. Maj. Gen.

Hon. ALEXANDER RAMSEY,
Secretary of War.

[First indorsement.]

Respectfully returned to the Chief of Engineers, with request for copy of these papers for the Attorney-General, and also for another copy of

the report of the Chief of Engineers of the 22d instant, and of the report of Major Gillespie of the 29th ultimo.

By order of the Secretary of War:

H. T. CROSBY,
Chief Clerk.

WAR DEPARTMENT,
January 25, 1881.

[Second indorsement.]

OFFICE CHIEF OF ENGINEERS, U. S. ARMY,
February 4, 1881.

Respectfully returned to the Hon. the Secretary of War, with copies of the papers called for.

Two copies of a letter to this office from Major Gillespie, dated January 17, 1881, relating to the subject and subsequently received, are also transmitted.

H. G. WRIGHT,
Chief of Engineers, Brig. and Bvt. Maj. Gen.

THE HON. THE SECRETARY OF WAR TO THE HON. THE ATTORNEY-GENERAL.

WAR DEPARTMENT,
Washington City, February 7, 1881.

SIR: I have the honor to transmit herewith copy of a communication dated December 1, 1880, from H. Villiard, president of the Oregon Railway and Navigation Company, protesting, on behalf of said company, against the construction of a bridge, alleged to have been authorized by State authority, over the Willamette River at Portland, Oreg. and I beg to invite your attention to the accompanying copies of the reports on this subject, from the Chief of Engineers and Major G. L. Gillespie, Corps of Engineers, dated respectively, December 29, 1880, and January 17 and 22, 1881, from which it appears that the bridge in question is being constructed in violation of the interests of commerce and navigation.

In view of the fact that Congress has assumed control and jurisdiction over the navigation of the Willamette River at Portland, and over the river generally (as will be observed from the acts referred to by the Chief of Engineers in his report of the 22d ultimo), I have respectfully to request that you will cause the proper United States district attorney to take such measures as will protect the rights of the United States in the preservation of its navigable waters.

Very respectfully, your obedient servant,

ALEX. RAMSEY,
Secretary of War.

The honorable The ATTONEY-GENERAL.

THE HON. THE ATTORNEY-GENERAL TO THE HON. THE SECRETARY OF WAR.

DEPARTMENT OF JUSTICE,
Washington, February 9, 1881.

SIR: I have the honor to acknowledge the receipt of your letter of the 7th instant, with inclosures from the Chief of Engineers and Major

G. L. Gillespie, Corps of Engineers, relative to the construction of a bridge over the Willamette River, at Portland, Oreg.

In compliance with your request, I have this day instructed the United States attorney for Oregon to take such measures as will protect the rights of the United States in the matter, forwarding to him a copy of your letter and the accompanying documents.

Very respectfully, your obedient servant,

CHAS. DEVENS,
Attorney-General.

Hon. ALEXANDER RAMSEY,
Secretary of War.

MAJOR G. L. GILLESPIE, CORPS OF ENGINEERS, TO THE CHIEF OF ENGINEERS.

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., December 2, 1880.

GENERAL: I have the honor to inclose herewith for the consideration of the department, two papers transmitted to me by property-holders of Portland, Oreg., relative to the construction of the bridge across the Willamette River at Portland, under the authority of the act of the legislature of the State of Oregon, October 18, 1878. Copies have been retained in this office.

Very respectfully,

G. L. GILLESPIE,
Major of Engineers, Bvt. Lieut. Col., U. S. A.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

STATEMENT OF JOHN AND ROBERT CATLIN, J. H. JONES, AND OTHERS, OWNERS OF REAL ESTATE FRONTING ON WILLAMETTE RIVER, IN PORTLAND, OREG.

The undersigned owners of real estate adjoining and fronting on the Willamette River, in the city of Portland, Oreg., believing the bridge now being constructed across said river to be an obstruction to its navigation and a nuisance, and with a view of having said obstruction removed and nuisance abated do make the following statement of facts:

The said bridge is being constructed from the foot of Morrison street, in said city, to N street, in the city of East Portland, and not at right angles across the channel and current of said river, with a draw of 100 feet.

All boats or vessels in passing from the river above said bridge to the river below must pass through said draw.

The Willamette River is navigable for ships and all sea-going vessels along the whole city front and any vessel which can reach the docks or wharves at the lower or north end of the city can be run to the wharves at the upper end of the city.

We are informed by competent judges, and do believe that if the proposed bridge shall be built it will be a very serious obstruction to navigation, and that few sea-going vessels will ever pass through said draw. During the winter months there is usually a strong current in the river where the bridge is located, which would make it hazardous for a vessel to pass through said draw.

That the crops and products of the country are mostly shipped to foreign countries during the winter months and at the time there is usually a considerable current in the river.

Large sums of money have been expended along the river bank above said bridge in building wharves and warehouses to accommodate commerce and shipping.

If the said bridge shall be constructed as proposed, it will work a great pecuniary

injury to the undersigned and obstruct the navigation of one of the finest rivers west of the Rocky Mountains.

We are informed and believe that the said bridge is being constructed by the Willamette Iron Bridge Company, and that Mr. Mallory, the district attorney of the United States for the district of Oregon, is its attorney at law; that he is a stockholder in and a director of said company; we therefore address this communication to you, and beg that you will lay it before the proper authorities, that the matter of the obstruction to navigation of said river by the construction of said bridge may be investigated, and hoping that eventually the construction of said bridge will be prohibited, and the river kept open to the commerce of the world.

To show our interest in the subject-matter of this communication, we set opposite our respective names hereto subscribed the property owned by us, respectively:

Names.	1 lot = 50 feet.	
	No. of block.	No. of lot.
John and Robert Catlin	73	N. ½ of 3.
J. H. Jones	74	1, 2, N. ½ 3.
Estate of I. A. Davenport, per Atkinson and Wakefield, agents	75	3 and 4.
Charles Holman	73	S. ½ 2.
Alexander Hamilton	73	N. ½ 4.
Mrs. Walter Moffett	73	S. ½ 4.
W. K. Smith, lot 4 and S. ½ of 3 in	74	S. ½ 3 and 4.
W. K. Smith, lot 1, 2, 3, 4 in	71	1, 2, 3, 4.
Smith Brothers & Company	101	1, 2, 3, 4.
Smith Brothers & Company, south of	101	760 feet.
Scheurer & Coyne	River front.	200 feet.
M. O. Lounsdale	S. ½ lot 1, N. ½ 73.	37½ feet.

Col. G. L. GILLESPIE,
Major of Engineers, U. S. A.

AFFIDAVIT OF CAPTAINS AND PILOTS OF STEAMBOATS.

STATE OF OREGON,
Multnomah County, ss:

We, N. H. Lane, H. A. Empkin, W. H. Smith, James Strang, J. H. Gist, Joseph Kellogg, C. W. Sprague, James T. Gray, J. M. Nickern, W. D. Taylor, George A. Pease, Philip Johnson, being duly sworn, say on oath, each for himself, and not for the other, that I am, and have been for a number of years last past, accustomed to navigate the Willamette River at and opposite to the city of Portland, in Multnomah County, State of Oregon, as captain and pilot of steamboats on said river, and have been accustomed to towing ships, boats, and vessels upon said river at said point; that I am familiar with the channel and current of said river at and opposite to said city of Portland, and I am acquainted with the plan and locality of the bridge proposed to be erected, and the construction of which has been commenced by the Willamette Iron Bridge Company, between the foot of Morrison street, in said city of Portland, and the foot of N street, in the city of East Portland, and across said river.

That, in my opinion, said bridge, in said locality, will prove to be a serious obstruction to navigation, both on account of the narrowness of the draw proposed to be constructed therein for the passage of boats and vessels, and because the angle of said bridge with the current, and the rapidity of said current thereat are such as to render it unsafe to attempt to tow ships and vessels through said draw in said bridge. That ships and other vessels have been and are accustomed to pass and repass to and from wharves and other points on and in said river above said proposed locality of said bridge at Morrison street. That the depth of water in the ship channel of the Willamette River above Morrison street to the extreme southern limits of the said city of Portland, above the proposed improvement of the Oregon Railway and Navigation Company, is sufficient to permit the passage of the largest ships that can enter the Columbia River or that can reach the city of Portland. That, in my opinion, and according to my belief, the interests of navigation and commerce demand that no bridge of the character of said bridge in process of construction from the foot of Morrison street aforesaid should be erected or constructed within the city limits, nor should

any bridge be constructed within said city limits without containing a sufficient draw to permit the passage with safety, at all seasons of the year, of sea-going vessels of the largest size and greatest depth of draught, and I verily believe that when the river is full and the wind high it will be next to impossible to tow any vessel through the draw in said bridge (as it is now being constructed) with any reasonable degree of safety.

N. H. LANE.
H. A. EMPKIN.
W. H. SMITH.
JAMES STRANG.
J. H. GIST.
JOSEPH KELLOGG.
C. W. SPRAGUE.
JAMES T. GRAY.
J. M. NICKERN.
W. D. TAYLOR.
GEO. A. PEASE.
D. WAKE.
L. A. BAILEY.
G. W. TAYLOR.
PHILIP JOHNSON.
JAMES E. DEMING.
P. B. SANBURN.

Subscribed and sworn to before me on this 29th day of November, A. D. 1880.
[SEAL.]
T. A. WOOD,
Notary Public for Oregon.

MAJ. G. L. GILLESPIE, CORPS OF ENGINEERS, TO THE CHIEF OF ENGINEERS.

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., January 17, 1881.

GENERAL: Since submitting my last report on the subject of the Willamette bridge, at Portland, I have the honor to state that all through the valleys of the Columbia and Willamette there has been a heavy fall of snow immediately followed by long and protracted rains, which have caused both streams to rise to unusual heights for this season of the year. The gauge at Portland read yesterday 21 feet 6 inches above low water, or 3 to 4 feet above highest record due to Willamette freshets at this season, and 1½ feet higher than any reading ever recorded. The Willamette has been filled with large drift logs, parts of bridges, and all the results of a disastrous flood. The tributaries are flowing with full banks, and the destruction to railroad bridges, wharves, and store-houses in the upper river has been unparalleled. A great deal of wheat on the lower wharves has been damaged here, because it could not be transferred in time to high-water wharves. No mails or dispatches have come from the East since the 10th, and no communications by land can be opened before the 24th. I have taken advantage of this high stage to make additional current observations at the Morrison street site, and find there a velocity of 6 miles per hour. It is to be considered that this velocity is reduced by reason of the Columbia being in freshet also, the gauge at the junction reading 13 feet 6 inches. I have watched the river carefully for four days past, and I can confidently say that a bridge at Morrison street which has a draw opening on either side of the pivot pier of only 100 feet in the clear will be a positive and ruinous obstruction to the navigation of the river, and will, at the extreme high stage which now exists, absolutely close the river above the bridge to any kind of navigation. The use of frame bents only 30 feet apart to support the roadway of the bridge on the east side will also cause the formation of large sunken timber rafts,

which will be required to be removed when the water recedes if the navigation of the river is to be preserved. I cannot send the current observations by the steamer which leaves in the morning, but will forward them by the steamer of the 23d.

Very respectfully, general, your obedient servant,

G. L. GILLESPIE,
Major Engineers.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

MAJ. G. L. GILLESPIE, CORPS OF ENGINEERS, TO THE CHIEF OF ENGINEERS.

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., January 19, 1881.

GENERAL: I have the honor to inclose herewith an outline tracing of the Willamette River on the city of Portland front, showing the current observations made, under my direction, from January 14 to 17, when that river was in flood. The water is still too high to show whether any material damage has been done to the bridge building at Morrison street. It will be noticed, by comparing the two series of observations, that the current curves are much flattened at the higher stages, and that the swiftest water, 6 miles per hour approximately, is embraced in the section covered by the proposed draw openings of the bridge. A careful inspection of the flow of the drift, during the several days when the river was rising rapidly, showed that the greater part passed out through the same section, though the quantity passing through a wide section, 300 feet to the eastward, was also very great.

This latter fact points to the necessity of having the spans on the east side wider than those given by the timber bents which are planned for that part of the bridge.

Very respectfully, general,

G. L. GILLESPIE,
Major Engineers, Bvt. Lieut-Colonel.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

REPORT OF MR. ROBERT A. HABERSHAM, ASSISTANT ENGINEER.

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., January 18, 1881.

COLONEL: I have the honor to submit herewith a chart showing the direction and force of the current of the Willamette River, during the flood, now abating, from opposite the foot of Market street to opposite the foot of E street, a distance of 5,500 feet, measured along the thread of the current.

The measurements were made between December 24, 1880, the gauge here reading 3.8, and January 17, the gauge reading 20.9. The highest point reached by the flood was 21.5; but as this occurred on Sunday (the 16th of January) I could not collect my party to measure the currents as I desired.

The annexed table, embodying the results of the work, and giving the heights of water at Portland, and at the mouth of the Willamette, shows the effect of the rise in the Columbia upon the current of the Willamette below the falls; the velocities in the latter decreasing as the heights increase, from the 15th to the 17th instant. In fact we know, from the reports from the upper stations, that the Willamette was falling

here during this time; and the whirlpools just below the Morrison street bridge, and in the sharp bend opposite E street, which on the 15th were violent and dangerous, on the 17th had almost disappeared.

The current was swiftest for 500 feet above and below the bridge, reaching 6 miles per hour at this point on the 15th. The *fall* over the pivot pier, at that time, was about 10 inches.

From a mark shown to me by Mr. Thomas A. Davis, an old resident, it appears that the flood of December, 1861, the highest heretofore recorded on the Willamette, reached 25.1 feet above low-water mark, running into the gutters at the corner of Stark and Front streets, or 3.6 feet higher than the present. In the absence of trustworthy reports from the gauges on the upper river, I cannot now say how much of the height reached by the present flood is due to the Columbia.

The freshet began to show itself here on the 10th of January, and culminated on the afternoon of the 16th, at 21.5 feet. The greatest rise in one day was 6 feet, from 1 p. m. on the 11th, to 1 p. m. on the 12th.

The quantity of drift wood brought down has been very large, the accumulations of nineteen years (during which time but one freshet at all approaching the present, viz., that of March, 1877, reaching 19.1 feet, has occurred), increased by the *débris* of the tornado which swept the Willamette Valley in January, 1880. The greater portion of the drift passed through the channel east of Ross' Island, which at high stages is the most direct, and carries the principal volume of water, and spread over the entire width of the river opposite the city; the largest trees and rafts generally keeping more towards the middle of the river. The rise of the Columbia at the same time with the Willamette, and the calm weather which prevailed during the flood, were very fortunate circumstances. Low water in the Columbia, with an east or southeast wind, would have increased the current to probably 8 miles an hour, and driven the heavy drift wood against the wharves and shipping, causing damage not easily estimated.

The bridge now building at Morrison street has suffered, losing two clusters of fender piles, which are so much bent by the current and drift that they will have to be replaced. When the flood abates the piers will also, in all probability, be found to have suffered injury.

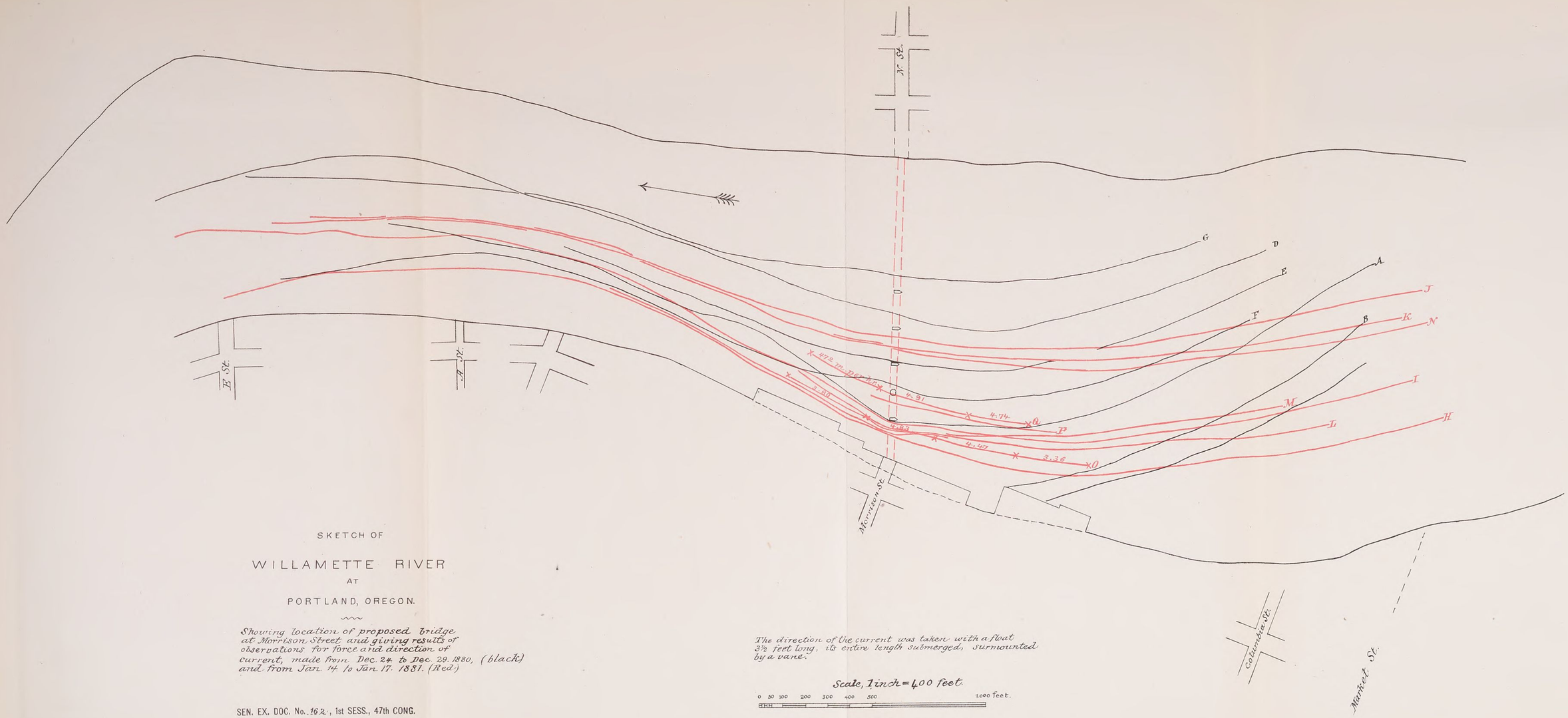
Respectfully submitted.

ROBERT A. HABERSHAM,
Assistant Engineer.

Col. G. L. GILLESPIE,
United States Engineers.

Current Measurement.

Date.	Line.	Gauge. Portland.	Gauge. Coon I.	Slope in inches per mile.	Velocity in miles per hour.	Remarks.
1880, Dec. 24	A	3.8				
" "	B	3.8	1.0	$3\frac{8}{10}$	0.83	
" "	C	3.8				
" 27	D	6.1				
" "	E	6.1	3.0	4	1.33	
" 29	F	7.4				
" "	G	7.4	3.8	$4\frac{8}{10}$	2.25	
1881, Jan. 14	H	17.3	11.2	$7\frac{1}{10}$	4.82	
" 15	I	19.4				
" "	J	19.5				
" "	K	19.6				
" "	L	19.9	12.4	$8\frac{5}{10}$	5.50	
" "	M	20.0				
" "	N	20.0				
" 17	O	20.9				
" "	P	20.9	13.9	8	4.70	
" "	Q	20.9				



SKETCH OF

WILLAMETTE RIVER

AT

PORTLAND, OREGON.

Showing location of proposed bridge at Morrison Street, and giving results of observations for force and direction of current, made from Dec. 24. to Dec. 29. 1880, (black) and from Jan. 14. to Jan. 17. 1881. (Red.)

SEN. EX. DOC. No. 162, 1st SESS., 47th CONG.

The direction of the current was taken with a float 3½ feet long, its entire length submerged, surmounted by a vane.

Scale, 1 inch = 400 feet.

0 50 100 200 300 400 500 1000 feet.

Forwarded to the Chief of Engineers, U.S.A. with report of Jan. 19. 1881.

G. L. Gillespie
Maj. Engineers.

THE ACTING ATTORNEY-GENERAL TO THE HON. THE SECRETARY OF WAR.

DEPARTMENT OF JUSTICE,
Washington, March 9, 1881.

SIR: Referring to your letter of the 7th ultimo, in relation to the construction of a proposed bridge across the Willamette River, at Portland, Oreg., I have the honor to inclose herewith, for your consideration and such advice as you may deem proper to give, a copy of a letter from the United States attorney for Oregon, in relation to this subject.

Very respectfully, your obedient servant,

S. F. PHILLIPS,
Acting Attorney-General.

Hon. ROBERT T. LINCOLN,
Secretary of War.

[First indorsement.]

OFFICE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
March 12, 1881.

Respectfully returned to the Hon. the Secretary of War.

If the case now pending in the United States court for the district of Oregon covers all the points in issue and will determine the rights of the United States in the protection of its navigable waters, it would seem that the desired end will be attained without the entering of another suit.

It is suggested, therefore, that further action upon the part of the United States in the matter be deferred until the result of the pending suit against the bridge company is known.

H. G. WRIGHT,
Chief of Engineers, Brig. and Bvt. Maj. Gen.

LETTER OF THE UNITED STATES ATTORNEY FOR OREGON.

OFFICE U. S. DISTRICT ATTORNEY,
Portland, Oreg., February 25, 1881.

SIR: I have the honor to acknowledge the receipt of your letter of the 9th instant, with inclosures relating to the construction of a proposed bridge across the Willamette River at this city, in which I am directed, by request of the Secretary of War, to take such measures as will protect the rights of the United States in the preservation of its navigable waters.

In reply, I have to say that there is now pending in the United States circuit court for this district a suit to stop the further progress of the work of constructing the bridge referred to, and all questions as to the rights of the bridge company to proceed will and can be as well and thoroughly tested in the case so pending as they could be if suit were commenced in the name of the United States. Several citizens of this city are plaintiff in this suit and allege an interest in the free use of the river for the purposes of commerce, which they claim are being put in jeopardy by the construction of the proposed bridge.

There is little doubt, I suppose, but that the real party behind these plaintiffs is the Oregon Railroad and Navigation Company, and their attorneys appear as attorneys of record in the case. In this condition

of the case I can see nothing which the United States can gain by an independent suit which will not be reached by the trial of the one now pending. If, in your judgment, this is the proper course to pursue, I will take no direct action on the part of the government until the case pending is disposed of. In my judgment a hearing of that case will settle all legal questions as effectually as though suit were in the name of the government.

If you are of opinion that it is necessary to a more full and complete determination of any question properly pertaining to the matter, I shall, upon your suggestion of such necessity, take immediate steps to bring the matter before the court.

I have the honor to be, very respectfully, your obedient servant,

RUFUS MALLORY,
United States District Attorney.

Hon. CHARLES DEVENS,
Attorney-General.

THE HON. THE SECRETARY OF WAR TO THE HON. THE ATTORNEY-GENERAL.

WAR DEPARTMENT,
Washington City, March 15, 1881.

SIR: I have the honor to acknowledge the receipt of a letter from Hon. S. F. Phillips, Acting Attorney-General, dated the 9th instant, inclosing copy of a letter from the United States attorney for Oregon, in relation to the construction of a proposed bridge across the Willamette River at Portland, Oreg.

I beg to reply that if the cause now pending in the United States circuit court for the district of Oregon will determine such questions affecting the general interests of navigation as are set forth in the report of Major George L. Gillespie, Corps of Engineers, which report has already been communicated to the Department of Justice, then it would appear unnecessary to institute an independent suit on behalf of the United States, but it is respectfully requested that the district attorney be especially instructed to examine the case in respect to the objections set forth by the engineer officer, and to report, after such examination, what particular legal points are involved therein affecting the rights of the bridge company to proceed with the construction of the bridge, and whether, in his judgment, any further legal steps may be necessary for the protection of the navigable waters in question, growing out of the location and construction of the said bridge.

Very respectfully, your obedient servant,

ROBERT T. LINCOLN,
Secretary of War.

The honorable the ATTORNEY-GENERAL.

THE HON. THE ATTORNEY-GENERAL TO THE HON. THE SECRETARY OF WAR.

DEPARTMENT OF JUSTICE,
Washington, March 16, 1881.

SIR: I have the honor to acknowledge the receipt of your communication of the 15th instant, in relation to the construction of a proposed

bridge across the Willamette River at Portland, Oreg., a copy of which has been forwarded to the United States attorney for Oregon.

Very respectfully, your obedient servant,

WAYNE MACVEAGH,
Attorney-General.

Hon. ROBERT T. LINCOLN,
Secretary of War.

THE HON. THE ATTORNEY-GENERAL TO THE HON. THE SECRETARY OF WAR.

DEPARTMENT OF JUSTICE,
Washington, April 30, 1881.

SIR: Referring to your communication of the 15th ultimo, in relation to the construction of a proposed bridge across the Willamette River at Portland, Oreg., I have the honor to inclose herewith, for your information, a copy of a letter from the United States attorney for Oregon.

Very respectfully, your obedient servant,

WAYNE MACVEAGH,
Attorney-General.

Hon. R. T. LINCOLN,
Secretary of War.

LETTER OF THE UNITED STATES DISTRICT ATTORNEY FOR OREGON

OFFICE UNITED STATES DISTRICT ATTORNEY,
Portland, Oreg., April 16, 1881.

SIR: Complying with instructions contained in your letter of the 16th March, inclosing letter of the Hon. Secretary of War, relating to the matter of the proposed bridge across the Willamette River at this place, and directing me to answer the case now pending in the United States circuit court relating to the proposed bridge, in respect to the objections set forth by the engineer officers, and to report, after such examination, what particular legal points are involved therein affecting the rights of the bridge company to proceed with the construction of the bridge, and whether, in my judgment, any further legal steps may be necessary for the protection of the navigable waters in question, growing out of the location and construction of said bridge, I have the honor to report that I have examined the said case pending against the bridge company, and find that the main points of objection relied upon by the plaintiffs to prevent the construction of the bridge are those suggested by the engineers in charge of this department. It is objected that the bridge should not be built at Morrison street, that the draw of 105 feet is not sufficient, and, in fact, that the bridge has no right to be built across the river here at all. The question has been submitted to the court on an application for a preliminary injunction, and at one o'clock on this day Judge Sawyer, circuit judge, granted a preliminary injunction which puts a stop to the further prosecution of the work. This, I suppose, will effectually put the matter to rest until some action can be had by Congress. There is no doubt but the people here should be

allowed a bridge, but if they have not proceeded according to law have not the authority of law to proceed they must wait until they ca get it.

Very respectfully,

RUFUS MALLORY,
United States District Attorney.

Hon. WAYNE MACVEAGH,
Attorney-General.

THE OREGON RAILWAY AND NAVIGATION COMPANY TO *THE HON.* THE SECRETARY OF WAR.

WASHINGTON, D. C., *April 7*, 1882.

SIR: Herewith please find inclosed copies of the opinions of Hon. M P. Deady, United States district judge for the district of Oregon, and Hon. Lorenzo Sawyer, of California, United States circuit judge for the ninth circuit, in the case of L. T. Hatch and M. O. Lownsdale *vs. The* Willamette Bridge Company, being a suit for perpetual injunction to restrain the construction of a bridge across the Willamette River at the foot of Morrison street in the city of Portland, State of Oregon, and in which case it will be seen said judges united in ordering a perpetual injunction, holding that the construction of *any* bridge at said point in the river would be such an interference with the navigation thereof as ought not to be permitted.

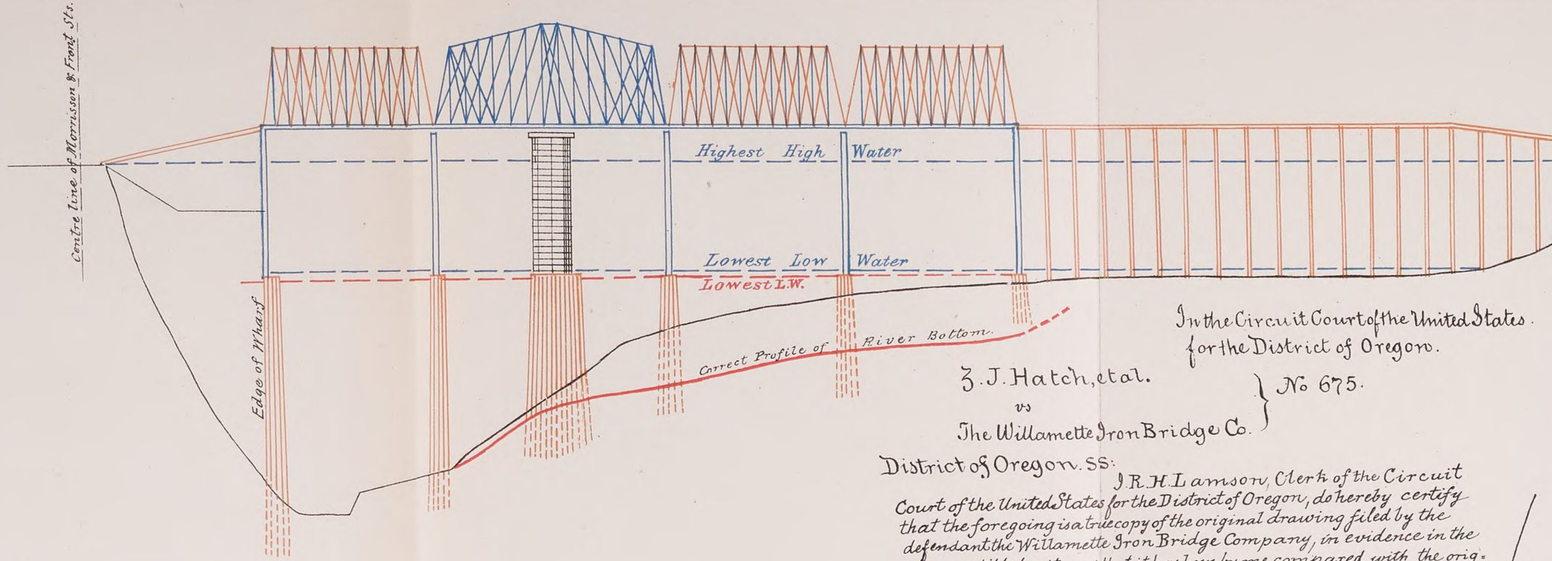
The undersigned, it will be remembered, and as will appear from the records of your department, filed a protest some two years ago against the construction of a bridge at such point. On investigation by your department the conclusion was reached that such protest was well founded, and a suggestion was made to the Department of Justice calling attention to the matter.

The Attorney-General of the United States, as we are informed, directed Hon. Rufus Mallory, United States district attorney, to institute proceedings for the purpose of testing the question in the courts. Before such instruction reached the district attorney, however, in Portland, Oreg., the above entitled suit had been commenced by private parties, and he advised the Department of Justice that in his *opinion* all questions in which the United States was interested in reference to the obstruction of navigation by the construction of said bridge at *such* point, could be determined in said suit, and the undersigned, now, for the information of the department, takes the liberty of communicating the inclosed copies of the opinions of the judges of the United States circuit court in regard to that matter, together with the testimony, affidavits, tracings, maps, &c., taken in such case by the plaintiffs *in sup*port of their complaint.

Very respectfully,

THE OREGON RAILWAY AND NAVIGATION CO.,
By H. VILLARD, *President.*

Hon. ROBERT T. LINCOLN,
Secretary of War.



In the Circuit Court of the United States.
for the District of Oregon.

J. J. Hatch, et al.
vs
The Willamette Iron Bridge Co. } No. 675.

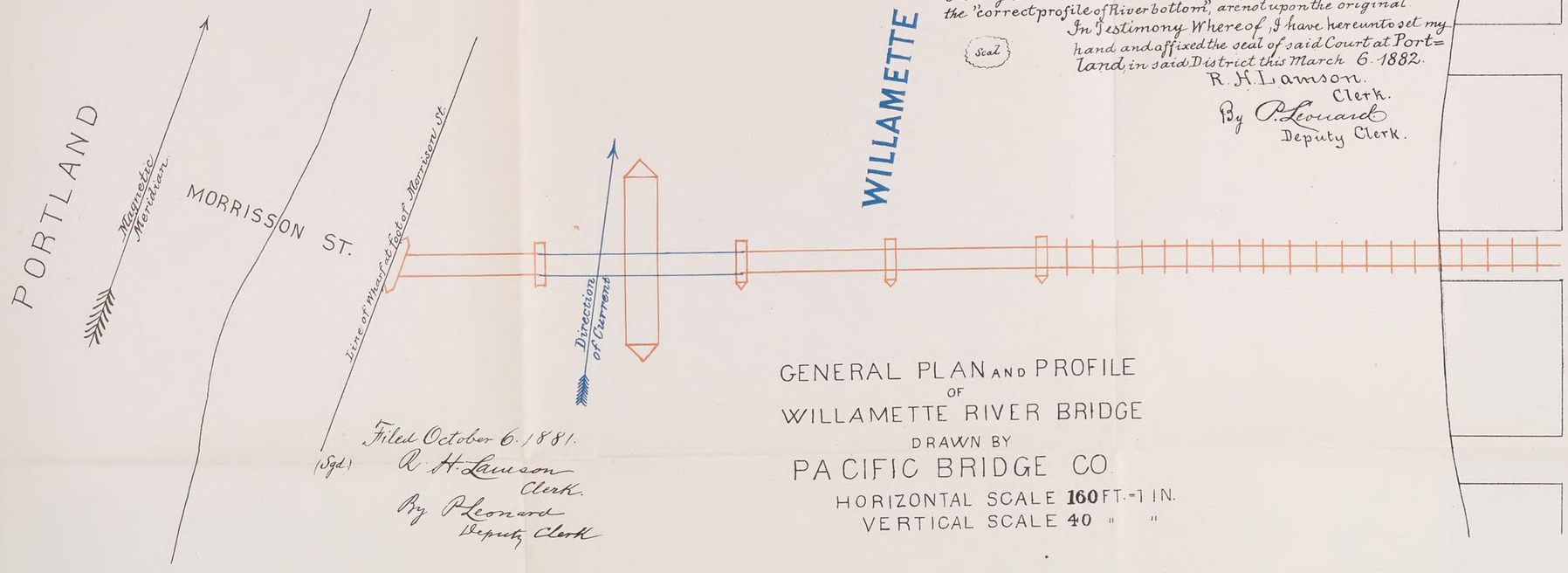
District of Oregon. ss:

I R. H. Lamson, Clerk of the Circuit Court of the United States for the District of Oregon, do hereby certify that the foregoing is a true copy of the original drawing filed by the defendant the Willamette Iron Bridge Company, in evidence in the above entitled suit, and that it has been by me compared with the original, and that it is a correct transcript there from, and of the whole of such original as the same appears on file at my office and in my custody. But that the red lines showing lowest low water line and the "correct profile of River bottom", are not upon the original.

In Testimony Whereof, I have hereunto set my hand and affixed the seal of said Court at Portland, in said District this March 6. 1882.

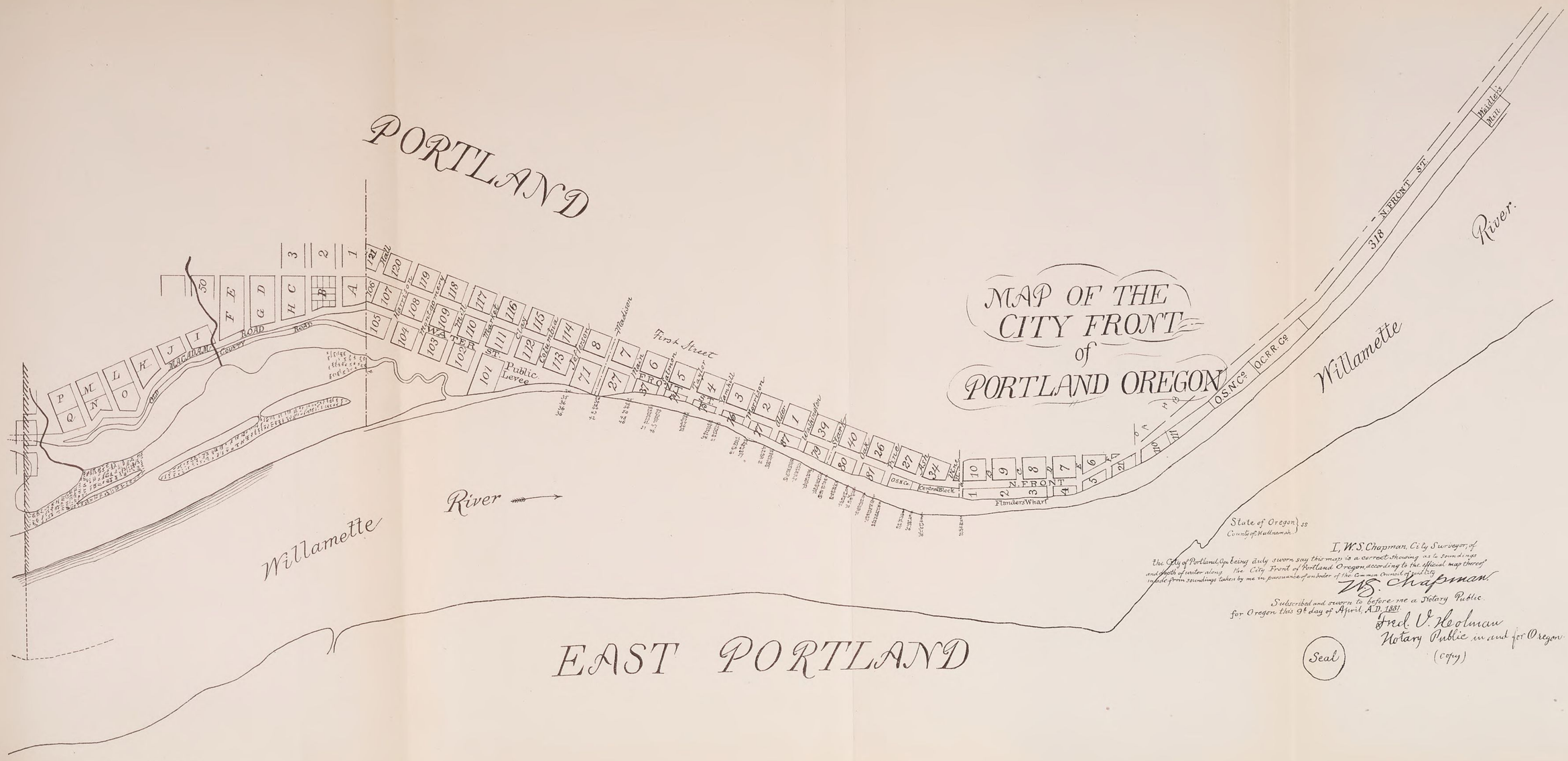
(Seal)

R. H. Lamson.
Clerk.
By P. Leonard
Deputy Clerk.



Filed October 6. 1881.
(Sgd) R. H. Lamson
Clerk.
By P. Leonard
Deputy Clerk

GENERAL PLAN AND PROFILE
OF
WILLAMETTE RIVER BRIDGE
DRAWN BY
PACIFIC BRIDGE CO.
HORIZONTAL SCALE 160 FT. = 1 IN.
VERTICAL SCALE 40 " "



State of Oregon } ss
County of Multnomah }

I, W.S. Chapman, City Surveyor, of the City of Portland, Or. being duly sworn say this map is a correct showing as to soundings and depth of water along the City Front of Portland Oregon, according to the official map thereof inside from soundings taken by me in pursuance of an order of the Common Council of said City.

W.S. Chapman.

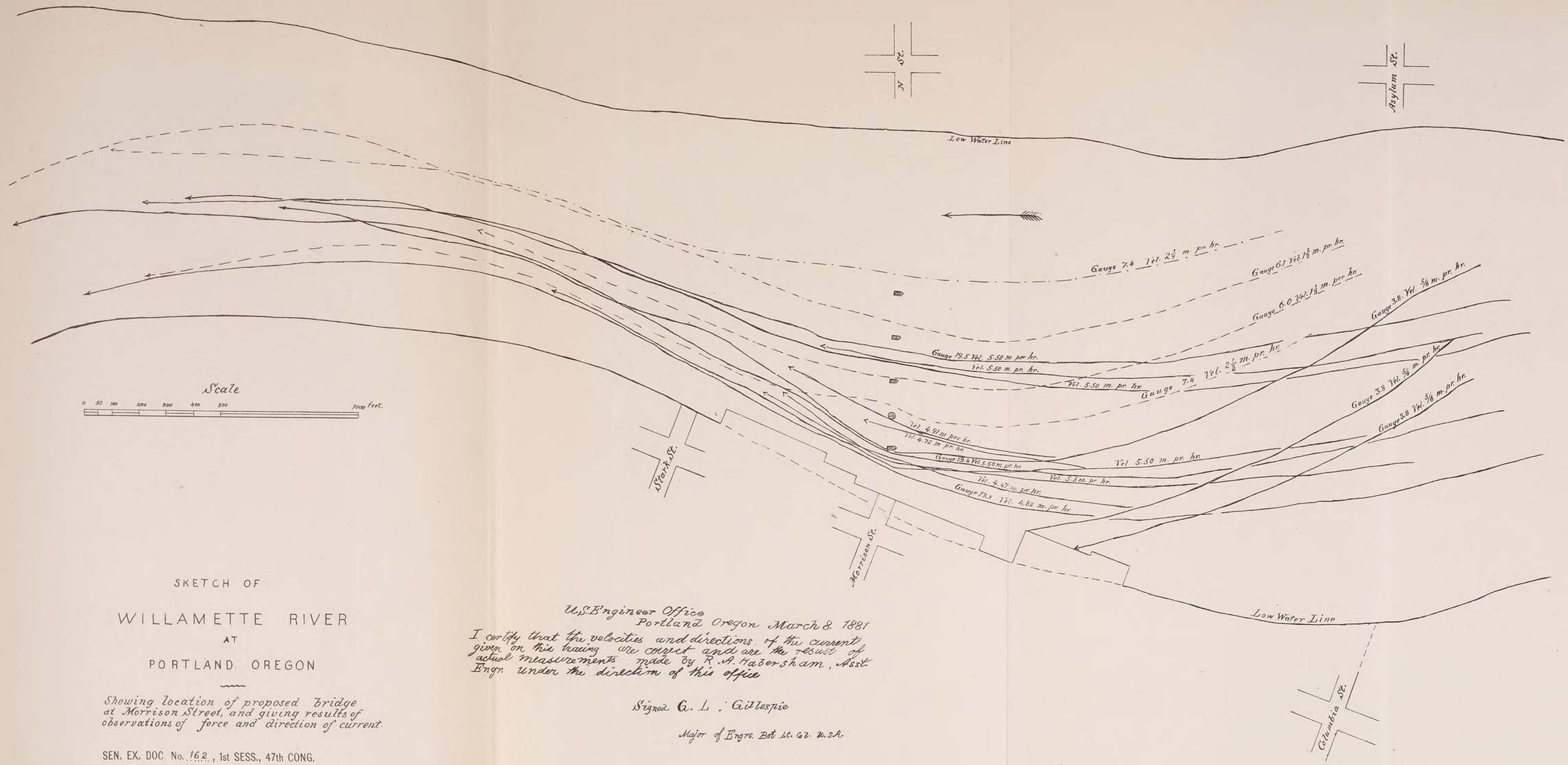
Subscribed and sworn to before me a Notary Public for Oregon this 9th day of April, A.D. 1881.

Fred V. Holman
Notary Public in and for Oregon.

(copy)

Seal

SEN. EX. DOC. No. 162, 1st SESS., 47th CONG.



SKETCH OF

WILLAMETTE RIVER

AT

PORTLAND OREGON

Showing location of proposed Bridge at Morrison Street, and giving results of observations of force and direction of current.

SEN. EX. DOC. No. 162, 1st SESS., 47th CONG.

U.S. Engineer Office
Portland Oregon March 8. 1881

I certify that the velocities and directions of the current given on this tracing are correct and are the result of actual measurements made by R. A. Habersham, Asst. Engr. under the direction of this office

Signed G. L. Gillespie

Major of Engrs. Bvt Lt. Col. U.S.A.

AFFIDAVIT OF MR. Z. J. HATCH.

In the circuit court of the United States for the district of Oregon.

Z. J. HATCH AND MILLARD O. LOWNSDALE, plaintiffs,
vs.
THE WILLAMETTE IRON BRIDGE COMPANY, defendants.

Affidavit for injunction.

UNITED STATES OF AMERICA,
STATE OF OREGON,
Multnomah County, ss:

I, Z. J. Hatch, being first duly sworn according to law, depose and say upon oath, I am one of the plaintiffs in the foregoing entitled suit; that I am the lessee of what is known as the Pacific Jones and Smith's Docks and Warehouses. These docks or wharves and warehouses extend along the river a distance of 450 feet, and extend from the wharf line or navigable water back to Front street, a distance of 200 feet. The warehouses have a capacity for storing 10,000 tons of grain. Before the erection of the bridge structure I had a proportion of about one-half of all the grain brought down the Willamette River on the river boats, for storage at these warehouses and transshipment to sea-going vessels. We have, in former seasons, furnished cargoes and parts of cargoes for about twenty-five vessels from our wharves and warehouses. Last year there were twenty-seven sea-going vessels took cargoes and parts of cargoes at my wharves. These vessels all loaded during the shipping season from October until April. Since last October I have had twelve vessels load or partially take on cargo at my wharves. I use my steamboat *A. A. McCully* for the purpose of bringing the vessels to my wharves from other wharves, generally below the site of the Morrison street bridge. I could use the *McCully* for carrying wheat from the upper river, but since the bridge piers and piling have been placed in the river it is difficult to get steamboats or tugs to bring vessels to my wharf; the Oregon Railway and Navigation Company will not allow any of their boats to take vessels past the site of the bridge since the piers and piling have been placed in the river, and Mr. Jacob Kaurm, while allowing the *Vancouver* and *Lurline* to take vessels up, charges double rates. The pilots will not move a ship up there with a small steamboat any more. Vessels have laid at my dock this winter for ten days at a time waiting for opportunity to get past the obstructions of piers and piling after they had completed their cargoes. There has never been a ship passed through the space left for a draw.

The number of tons of merchandise I shipped the last season from my docks to sea-going vessels aggregates 50,000 tons, aggregating $1,500,000 in value. I estimate, from my experience since the obstructions for bridge were placed in the river at Morrison street, that fully one-third less freights have been taken than formerly from my wharves, and the value of my steamboat *McCully* as a tug, to bring vessels to my wharves from below, has been entirely destroyed; that is to say, it is only because I am forced to use her to tow vessels past the piers and pilings, because I can't hire any other tugs, on account of the risk, that I use her at all, and I am using her now at a ruinous risk, liable to sink her any time I pass the peirs with a tow. The captains of the vessels coming to my docks make me and my tug assume all responsi-

bility of towing them safely past the piers and piling, and they won't come if they can get cargoes elsewhere. The only way to get a loaded vessel down from the wharves past the bridge obstruction is to drop her down; there is not sufficient depth or room in the ships' channel opposite Pacific Docks to swing a vessel and get her under way to pass the piers bow on. In my judgment, the draw in the bridge should be at least 200 feet in the clear to allow the class of vessels that come to my docks a safe passage-way.

There are four steam ferry-boats plying across the Willamette River within a distance of about 2¼ miles along the city front of Portland. The Jefferson street ferry plies from the foot of Jefferson street across to U street. They have one boat, scow-shaped, with a capacity of about 100 tons. The Stark street ferry plies from the foot of Stark street to the foot of L street, in East Portland, opposite. This ferry company have two boats; one scow-shaped steamboat, with a capacity of about 150 tons, and another large steamboat, with a capacity of about 350 tons. The next is the railroad ferry; an iron steamboat in present use and a wooden one held in reserve. These boats have a capacity of about 500 tons. They ply from H street, in Couch's addition, to the railroad depot in East Portland. The Albina, steam ferry-boat, plies from the southern limit of the town of Albino, on the river, to a slip on the Portland side, about opposite. It has a carrying capacity of about 60 tons. These ferry lines are all regularly plying, as above stated; and are exclusively engaged in transporting passengers, freight, and teams across the river. I have hereto attached a map of the cities of Portland, East Portland, and their vicinities, which I believe to be substantially correct, and upon it I have indicated by name the location of several ferries across the river, and also the site of the proposed bridge. I offer the same as an exhibit to this my deposition, and attach the same thereto, marked Exhibit A. I also attach, and have marked as Exhibit B to my deposition, authenticated copies of Maj. G. L. Gillespie's reports and tracings upon the subject of the proposed bridge at Morrison street.

And I further swear that the said copies are true copies of documents procured by my attorneys from Hon. P. Mallory, United States attorney for the district of Oregon, and in his possession, as I verily believe, under circumstances detailed in his communication addressed to the Standard, newspaper, which said published communication I also attach, marked Exhibit C.

That I also append hereto, as an Exhibit D to my deposition, a printed copy of surveys of United States engineers of the Willamette River and location of bridge at Portland, Oreg., which I obtained at United States engineer's office at Portland, Oreg.

I further swear that in my opinion from the number of workmen employed by the bridge company, and the energy with which the work is being prosecuted, both in the building of the piers and abutments, and in preparing and shaping the material for the superstructure, that they will have spanned the river by the bridge by the first of July next, and that Mr. Garrill, the contractor for the building of the bridge, states positively that he will have the same completed by the 1st of June, 1881.

I also attach hereto as Exhibit E, to this my deposition, copies of the licenses and enrollment of the steamboat McCully.

Z. J. HATCH.

Subscribed and sworn to before me this 17th March, 1881.

[L. S.] H. S. BINGHAM,

Notary Public for the State of Oregon.

THE CHIEF OF ENGINEERS TO THE HON. THE SECRETARY OF WAR.

OFFICE OF THE CHIEF OF ENGINEERS,
Washington, D. C., December 30, 1872.

SIR: The letter of Mr. W. T. Caldwell, auditor and clerk of the city of Portland, Oreg., with accompanying plans, &c., of the bridge authorized by the act of February 2, 1870, to be built over the Willamette River at that place, referred to this office, is herewith respectfully returned.

The question of plan and location of the bridge was referred to a Board of Engineer Officers for examination and report. The report is inclosed.

The Board is of the opinion that the axis of the bridge should not vary more than ten degrees either way from a straight line joining the foot of Columbia street, on the west side, with that of Asylum street, on the east side of the river; that the axis of the piers should be parallel to the threads of the current; that the plan be modified so that the upper portion of the draw-pier shall be of masonry, as suggested in the report, and that the height of the bottom of the lower chord shall be at least ten feet above extreme high water. The above requirements being complied with at the location selected, the plan proposed for the bridge—as to height of structure, length of spans, and form and dimensions of piers—will not obstruct, impair, or injuriously modify the navigation of the Willamette River.

The views of the Board are concurred in.

Very respectfully, your obedient servant,

A. A. HUMPHREYS,
Brigadier-General and Chief of Engineers.

Hon. W. W. BELKNAP,
Secretary of War.

[Indorsement.]

The views of the Board of Engineers are concurred in by the Secretary of War, who directs that measures be taken to cause their recommendations to be carried out.

By order of the Secretary of War.

H. T. CROSBY,
Chief Clerk.

WAR DEPARTMENT, *January* 2, 1873.

REPORT OF THE BOARD OF ENGINEERS FOR THE PACIFIC COAST.

OFFICE BOARD OF ENGINEERS FOR THE PACIFIC COAST,
San Francisco, Cal., November 27, 1872.

GENERAL: The maps, drawings, and papers relating to the bridge proposed to be built across the Willamette River at Portland, Oreg., submitted to the Secretary of War for his approval, under the act of Congress of February 2, 1870, and referred for examination and report to the Board of Engineers for the Pacific coast by the Chief of Engineers, under date of October 12, 1872, having been duly examined and considered, that Board now submits the following—

REPORT.

The Willamette River is navigable during the greater part of the year for vessels drawing 18 feet of water to Portland, twelve miles above its confluence with the Columbia.

During the autumn of each year there usually occurs a period of low water in the Willamette, and during this period vessels of 18 feet draught running to Portland are obliged to take in and discharge a part of their cargoes below the mouth of the Willamette, on account of bars in that river near its mouth. When these bars shall have been removed larger vessels will doubtless visit this port.

At present the lower part of Portland is especially devoted to commercial pursuits, and the tendency of the business portion of the city, for the past few years, has been down the river. If the growth of the city should continue in this direction, it is not probable that many vessels, other than the ordinary river-boats, will find an inducement to pass above the site of the proposed bridge.

The winter rains and thaws near the headwaters of the Willamette and its tributaries cause at times heavy floods and great variations in its currents.

On the map of the river furnished the Board, which should, to satisfy the requirements of the act authorizing the erection of the bridge, show the depth of water and the currents at all points near the site, nothing is given showing their direction or strength. It is stated, however, that in an unusually severe winter, such as may occur, perhaps, at intervals of ten years, a rise of 28 feet above the lowest stage has been known. Competent river men then estimated the velocity of the current to be, perhaps, 8 miles an hour for a short time.

During the highest waters of ordinary winter it has been found that the greatest velocity is 4 miles per hour.

The rise in summer is due to back-water from the Columbia, which is then high from the melting snows in the mountains at its source and those of its upper affluents, the waters of the Willamette above the falls at Oregon City being then at an ordinary stage. There is little or no current in the latter river at Portland under these circumstances.

The bridge is located at the upper part of the city. One extremity is fixed by the terms of the charter at the foot of Columbia street. The location of the other or eastern end is not yet definitely decided upon. Some latitude is desired in this by the projectors of the bridge.

The Board is of the opinion that the line of direction of the axis of the bridge should not vary more than ten degrees either way from a straight line joining the foot of Columbia street on the west side, with that of Asylum street on the east side of the river; also that the point within the above limits should be finally determined or approved by an officer of the Corps of Engineers, and that whatever may be the obliquity of the axis of the bridge, those of the piers must be parallel to the current.

The proposed bridge is to be of wood, resting on wooden piers partially filled with stone.

There are seven spans of 200 feet each, and one double draw, with openings of 113 feet 3 inches each.

The length of the bridge proper is 1,715 feet, while the approach on the east side on trestle-work, 922 feet long, increases the total length to 2,637 feet.

The bridge is to contain two roadways, one for a single-track rail-

road, the other for ordinary travel, each 16 feet wide in the clear. There are also two footways, each 4 feet 6 inches wide in the clear.

The location of the double draw is judicious, and as each opening is 100 feet wide in the clear at low water, it is deemed ample for any vessels likely to pass through it.

The level of the roadway near the western extremity of the bridge is to be that of the intersection of Front and Columbia streets. The drawings show this level to be 45 feet above mean low water.

If the roadway of the bridge were placed on this level, the bottom of the lower chord of the bridge would be 13 feet above extreme high water in the river.

The drawings, however, show the roadway of the bridge at a height of only 39 feet above low water. This places the bottom of the lower chord only 7 feet above extreme high water.

On account of the heavy drift timber which sometimes finds its way down this river in great floods, we would recommend that the roadway of the bridge be placed as high as 42 feet above mean low water, or 3 feet below the grade at the intersection of Front and Columbia streets. This would place the bottom of the lower chord at a height of 10 feet above extreme high water.

The substructure of the piers is a heavy frame-work or crib of timber filled with stone, and sheathed on the outside with iron. This construction extends from the bed of the river up to the level of low water.

This substructure, being always covered by fresh water, will be comparatively permanent.

From this foundation an open frame-work of timber, supported by a system of piling passing through the substructure, and sheathed on the outside with planking, supports the bridge.

The upper portion of the piers, as well as the bridge itself, being alternately wet and dry, will be subject to decay, but may be renewed from time to time without materially interfering with the travel on the bridge.

The construction of the draw-pier is similar to the others, except that the wooden frame-work, filled with stone, is carried up to the under side of the bridge to receive and support the draw-machinery. The timbers of the upper portion of this draw-pier will be subject to decay, and as the sheathing rots away the stone filling will be liable to escape and obstruct the channel-ways.

For this reason we think this draw-pier, from low water upward, should be built of masonry. The pier is so large that dry stone masonry would answer. It could then be sheathed with timber, if necessary, but the stone should hold up the timber, and not the timber the stone.

From recent examinations, under instructions of the Board, it has been ascertained that at the site of the proposed bridge a hard subsoil, offering a good foothold for piles, can be reached at a moderate depth below the bottom of the river. It is believed, therefore, that with proper precaution by riprapping, piling, or otherwise, the western abutment and the substructure of the piers may be secured from undermining by such changes in the velocities and actions of the currents as may be due to the diminution of the water-way caused by the structure.

The Board does not deem it necessary to examine the details of the construction of the bridge proper, because by the terms of the charter both the spans and the draw are to be capable of sustaining a load equal to three tons per linear foot.

With the limitation as to the site of the bridge, *i. e.*, that its axis shall not vary more than ten degrees either way from a straight line joining the foot of Columbia street on the west side with that of Asylum street on the east side of the river, and that the axis of the piers be placed parallel to the threads of the current, and with the modification that the upper portion of the draw-pier shall be of masonry, as suggested, and that the height of the bottom of lower chord of the bridge shall be at least 10 feet above extreme high water, the Board is of opinion that the bridge, at the location selected and on the plan proposed, *i. e.* as to height of structure, length of spans, and form and dimensions of piers, will not obstruct, impair, or injuriously modify the navigation of the Willamette River.

The drawings of the bridge (six sheets) are forwarded to the Department to-day.

The papers, &c., received are herewith inclosed.

Respectfully submitted.

HENRY M. ROBERT,
Major Engineers.
G. H. MENDELL,
Major Engineers.
C. SEAFORTH STEWART,
Major Engineers.
B. S. ALEXANDER,
Lieutenant Colonel Engineers,
President Board of Engineers, Pacific Coast.
JOHN H. WEEDEN,
First Lieut. Engineers, Recorder.

Brig. Gen. A. A. HUMPHREYS,
Chief of Engineers, U. S. A.

THE WILLAMETTE BRIDGE—OPINION OF JUDGE DEADY ON THE QUESTIONS AT ISSUE—PRELIMINARY INJUNCTION GRANTED.

U. S. circuit court, district of Oregon, Monday, March 28, 1881.

Z. J. HATCH AND M. O. LOWNSDALE
v.
THE WILLAMETTE IRON BRIDGE COMPANY. } No. 675.

Suit in equity for an injunction—motion for a preliminary injunction.

(1.) JURISDICTION.—A suit arises out of a law of the United States, when the controversy involved in it turns upon the proper construction or application of such law; and therefore a suit by the owner of a vessel authorized to engage in the coasting trade upon the Willamette River, and by riparian owners thereon, to enjoin the erection of a bridge over said river at Portland as being in violation of the act of Congress under which said vessel was enrolled and licensed, and the act of Congress (11 Stat., 383) declaring said river a free and common highway, arises under said laws, whether the plaintiffs are entitled to the relief sought or not.

(2.) NAVIGABLE WATERS—CONTROL OF.—The power of Congress to regulate commerce (Con., art. 1, §8) includes, for the purposes of commerce, control of all the navigable waters of the United States which are accessible from a State other than the one in which they lie; and for this purpose they are the waters of the nation, and subject to the legislation of Congress in every particular affecting their navigability or use as instruments or means of Congress.

(3.) BRIDGES—NAVIGABLE WATERS.—The State has the sole power to bridge the waters within its limits, but this power is subject to the power of Congress to prevent obstructions to navigation being placed in such waters within the State and accessible from without it; and therefore, in the absence of legislation by Congress to the contrary, a State may dam or otherwise obstruct the navigable waters within its limits at pleasure.

(4.) CONGRESSIONAL ACTION—CONSTRUCTION OF.—The acts of Congress authorizing a vessel to engage in the coasting trade within a State are construed as not manifesting an intention upon the part of Congress to interfere with the power of the State to obstruct the navigable waters within its limits, but only to authorize their navigation by such vessel for the purposes of such trade so long as they are navigable.

(5.) IDEM.—The provision in section 2 of the act of February 14, 1859 (11 Stat., 383), admitting Oregon into the Union, which declares that "all the navigable waters of said State shall be common highways and forever free" to all the citizens of the United States, is paramount to a law of the State authorizing a bridge to be erected across the Willamette River; and therefore, if such bridge as proposed to be constructed will materially impede or obstruct the free navigation of said river, it is unlawful, and the parties constructing it may be enjoined at the suit of riparian owners injured thereby.

(6.) INJUNCTION GRANTED.—A preliminary injunction granted to restrain the building of a bridge over the Willamette, with a draw of only 100 feet on either side of the pivot-pier, under the authority of an act of the State legislature authorizing the building of such bridge with a good and sufficient draw of not less than 100 feet, upon evidence showing that such a bridge would materially obstruct the navigation of the river, because said act did not absolutely authorize a bridge with a draw of only 100 feet, and if it did it was in conflict with the act of Congress of February 14, 1859, *supra*, declaring the river a free and common highway, and therefore it is void.

DEADY, *J.*:

On October 18, 1878, the legislature of Oregon passed an act authorizing the "Portland Bridge Company," a corporation incorporated under the laws of Oregon, "or its assigns," to build a bridge, "for all purposes of travel or commerce," across the Willamette River, between Portland and East Portland, "at such point or location on the banks of said river" as it might select, "on or above Morrison street of said city of Portland;" "provided that there shall be placed and maintained in said bridge a good and sufficient draw of not less than 100 feet in the clear in width of a passage-way, and so constructed and maintained as not to injuriously impede and obstruct the free navigation of said river, but so as to allow the easy and reasonable passage of vessels through said bridge."

On July 16, 1880, the defendant, The Willamette Iron Bridge Company, as the assignee of said Portland Bridge Company, commenced the erection of a bridge across the river from the foot of Morrison street in Portland to N street in East Portland. At this point the river is about 1,400 feet wide at extreme low water, with a depth of not less than 50 feet for 200 feet from the Morrison street wharf along the line of the proposed bridge, whence it gradually shoals to 23 feet at a further distance of 250 feet. The river rises in the winter months from the rains, and in the spring is backed up by what is known as the June rise in the Columbia. The highest water is 28 feet above low water, and during the past winter the rise was 21.6 above low water.

The current in the ship channel along the line of the proposed bridge is nearly parallel with the direction of the opening between the piers, and varies in velocity from 1 to 7 miles an hour, and at average high water is from 3 to 4 miles an hour. During the winter months strong southerly winds blow down the river for days at a time.

The abutment pier is to be placed at the bank in front of the Morrison street wharf, and the spaces between the next five piers are as follows: The first, 180 feet; second, a space on either side of the draw pier of 100 feet each, and then two spaces of 200 feet each.

The piers are constructed by driving piles inside of wooden cribs, and filling the spaces between them with loose stone up to a little below low-water mark, and above with iron tubes filled with concrete, except the draw pier, which is to be of masonry above low water. The spans

are to be of wood, except the draw, which is to be of iron. The lower chord is to be 8 feet above high water. The five piers east of the western abutment are now above low water.

On January 3 the plaintiffs filed their bill in this court to enjoin the defendant from constructing this bridge, on the ground that the same is and will be a serious and unlawful obstruction to the navigation of the river. Among other things, the bill alleges, that Lownsdale is the owner of an interest in wharves and warehouses on blocks 73 and 74 of Portland on the west bank of said river—a distance of about 600 feet above the location of said bridge, of the value of $10,000, and that the plaintiff Hatch is the lessee of the whole of said property for a term of years at a rent of $700 per month; that a large portion of the commerce of the Willamette Valley has been done through and at said wharves and warehouses; that a large portion of the wheat raised in said valley has been received and stored there for shipment in sea-going vessels to foreign ports; that vessels carrying 2,000 tons can navigate the channel on the west side of the river for a distance of a mile above Morrison street, and therefore that bank is now occupied by wharves and warehouses engaged in the commerce of the Willamette Valley and other portions of the coast and Europe; that the space allowed for a draw in said bridge is too narrow to admit the passage of vessels with safety, and therefore they cannot and will not come to complainants' wharves to discharge and receive cargo, to their great and permanent injury; that the plaintiff Hatch is the owner of an enrolled and licensed steamboat—the A. A. McCully—which is employed in towing vessels to and from the wharves aforesaid, upon the river aforesaid, and that the erection of said bridge with so narrow a draw opening prevents the same from being done with safety, to his injury.

It appears from the affidavit of C. H. Gorril that he and his brother, R. W. Gorril, of California, are stockholders in the defendant corporation, and are engaged as contractors in the construction of the bridge; that they are to receive $150,000 for the work, and are under bonds in the sum of $20,000 to complete the same by April 1, 1882; that they have expended on the work $50,000, including the purchase and preparation of the timber and lumber for seven of the eight spans, and all the iron for the same, and that if not restrained by this court they will complete the bridge by June 1.

Section 1 of the act of March 3, 1875 (18 Stat., 470), which, among other things, gives this court jurisdiction of a suit in equity arising under a law of the United States includes this case.

Congress has power "to regulate commerce with foreign nations and among the several States" (Con. art., 1, § 8), and this includes, for the purpose of commerce, the control of all the navigable waters of the United States, which are accessible from a State other than that in which they lie. For this purpose they are the waters of the nation and subject to the legislation of Congress in every particular affecting their navigability or use as instruments of commerce. Gibbons *v.* Ogden, 9 Whea., 1; Penn. *v.* W. & B. Bridge Co., 18 How., 431; Gilman *v.* Philadelphia, 3 Wall., 724.

In pursuance of this power to regulate commerce, Congress has provided (Title L, of the R. S.) that certain vessels, when enrolled and licensed as required by law, shall have the right to engage in the coasting trade—that is, the trade upon the navigable waters of the United States. The plaintiff Hatch is the owner of a vessel so enrolled and licensed for this district, and his contention is that this bridge will and does prevent the enjoyment of this right, and therefore this suit arises

out of a law of Congress, as applied to the facts and circumstances of the case.

Again, the act of Congress of February 14, 1859 (11 Stat., 383), admitting Oregon into the Union, provides (§ 2) "that all the navigable waters of said State (Oregon) shall be common highways and forever free, as well to the inhabitants of said State as to all other citizens of the United States, without any tax, duty, toll, or impost therefor." Both the plaintiffs are riparian proprietors upon the stream over which this bridge is being built, and their contention is that it does and will obstruct the navigation of the river so as to prevent its being used as a common highway, to their injury as such proprietors, and therefore this suit arises, out of a law of Congress as applied to the facts and circumstances of the case.

To sustain jurisdiction under this clause of the act of 1875, *supra*, it is not necessary to show or assume that the plaintiffs are entitled to the relief sought, but it is sufficient if the controversy turns upon or grows out of the proper construction or application of these acts of Congress, or either of them.

The power to authorize the erection of a bridge over a navigable water of a State for the convenience of the inhabitants thereof, belongs to the State as a part of its general police power. Congress does not possess this authority directly, *eo nomine*, but its control over the navigable waters of the States as a means of commerce, gives it a practical veto upon the power of the State in this respect. Therefore no State can authorize or maintain the erection of a bridge over a navigable water, which in effect contravenes or conflicts with a law of Congress concerning the navigation of the same. And the fact that such water is wholly within the State is immaterial, if it is accessible from another State or forms a part of a navigable way between itself and other States.

If, then, this bridge in its construction or effect is in conflict with either of these acts of Congress, it is so far unlawful, and if injurious in its operation to the rights of the plaintiffs is a nuisance and may be prevented or abated. But if it does not contravene such law, then, however it may inconvenience or obstruct the navigation of the river, this court cannot interfere. The power of Congress to regulate the navigation of the river does not execute itself; nor can this court enforce it until Congress has declared its will on the subject. Until then the power is dormant and the authority of the State is sufficient to justify any structure or obstruction that may be placed therein.

In this case the defendant insists that it is building this bridge in pursuance of a law of the State, and that there is no law of Congress upon the subject to the contrary, and therefore it is lawful.

Does the law under which Hatch's steamboat is authorized to engage in the coasting trade conflict with the act of the legislature authorizing this bridge? Upon the authorities I do not think it does. The Supreme Court seems to have been careful not to declare a conflict between State and Federal legislation on this subject upon mere implication. And the reason of this is apparent. Congress can at any time declare specifically what shall be a lawful bridge and what shall not, and as it belongs more properly to the political than the judicial power, to determine such questions, the courts will not assume that a bridge is an unlawful obstruction because it incidentally conflicts with or limits some right or privilege claimed or existing under an act of Congress.

A license to engage in the coasting trade means something. As was said by Mr. Justice Swayne, in Gilman *v.* Philadelphia, *supra*, it "carries with it right and authority. 'Commerce among the States' does

not stop at a State line. Coming from abroad it penetrates wherever it can find navigable waters reaching from without into the interior, and may follow them up as far as navigation is practicable." And in Gibbons *v.* Ogden, *supra*, it was held that a law of the State of New York giving certain persons the exclusive right to navigate the waters of that State by vessels propelled by steam or fire, as against such license, was void.

In this last case the law of the State was in direct conflict with that of Congress. The latter said in effect to its licensee, you are authorized to navigate the waters of New York with vessels propelled by steam, while the former said, you shall not do so.

But in this case there is no necessary conflict between the law of the State and the United States. A license to engage in the coasting trade on the Willamette River is a license to navigate only so far as it may be navigable. But if the State, in the exercise of its police power to build bridges, obstructs or even destroys the navigation of the river, the weight of authority, and, I think, of prudential reason, is that the act of Congress licensing the plaintiff's steamboat to navigate it, is not thereby infringed. It is thought to be safer for the courts not to assume that Congress intended to interfere with and restrain the power of the State over the navigability of the rivers within its jurisdiction until it says so directly or by necessary implication.

Therefore, in the cases of Wilson *v.* Blackbird Creek Marsh Company, 2 Pet., 245; The Passaic Bridges, 3 Wall, 782, and Gilman *v.* Philadelphia, *ib.*, 713, it was held that the enrollment and license acts which authorized vessels to navigate the waters of particular States were not sufficient to warrant the inference that Congress thereby intended to interfere with the right of the States to dam or otherwise obstruct the navigation of said waters.

Does the act of February 14, 1859, *supra*, conflict with the act of the State legislature authorizing the erection of this bridge? This act, unlike the one providing for the enrollment and license of vessels, relates directly to the navigability of the waters within the State. Its only purpose is to preserve them for the free use of all the citizens of the United States as common highways. It was passed by Congress in pursuance of its control over them as a means of commerce (Pollard *v.* Hogan, 3 How., 229) to secure their free navigability to the inhabitants of the Union, against the possible exactions and obstructions of local authority, prompted by considerations of local convenience or selfishness.

The provision, even to its very language, is as old as the articles of compact between the original States and the people and the States of the territory northwest of the Ohio, contained in the ordinance of 1787, for the government of said territory, from the fourth of which it is copied. This ordinance was ratified or recognized by the first Congress under the Constitution (1 Stat., 50), and the provisions securing the freedom of "the navigable waters leading into the Mississippi and Saint Lawrence" has been continued in force in all the States formed out of said territory to this day. Columbus Ins. Co. *v.* Curtenius, 6 McLean, 209.

In Penn. *v.* W. & B. Bridge Co., 13 How., 518, it was held that a provision in a compact (December 18, 1789) between Virginia and Kentucky concerning the erection of the latter into a State, to the effect that the navigation of the Ohio, so far as the territory of the two States joined thereon, "shall be free and common to the citizens of the United States," which was afterwards sanctioned by Congress in the passage

of the act (1 Stat., 189) admitting Kentucky into the Union, was a restraint upon the power of Virginia to obstruct the navigation of said river by the erection of a bridge thereon within her own limits, and that a bridge so erected which was a substantial obstruction to such navigation was a nuisance and unlawful.

To the same effect is the decision in Columbus Ins. Co. *v.* Curtenius, *supra*, in which it was held that Congress had declared, by the ordinance of 1787 and otherwise, that the navigable tributaries of the Mississippi were free and common highways to the citizens of the United States, and that therefore an act of the legislature of Illinois, authorizing the construction of a bridge across the Illinois River near Peoria, was void if such bridge was a material obstruction to the navigation of said river, as being in conflict with the Federal legislation declaring it free and common.

These decisions are the authoritative and uncontradicted exposition of the effect of Federal legislation declaring a navigable river forever free and common to the citizens of the United States, upon the otherwise unlimited power of a State to obstruct or impede the navigation thereof within its own limits. And the reasoning upon which they rest seems unanswerable. It is self-evident that a river cannot be a common highway, forever free to all the citizens of the United States, which the legislature of any one State has the power to essentially obstruct.

In a well considered case cited by the defendant (The People *v.* S. & R. Ry. Co., 15 Wend., 132), in which the right to bridge the Hudson River in pursuance of an act of the State legislature was under consideration, Mr. Ch. J. Savage announced the same conclusion, saying: "The place where * * * the bridge is built is one which coasting vessels have a right to pass and where any obstruction entirely preventing or essentially impeding the navigation would be unlawful."

In comparing the Federal and State act to ascertain if there is any conflict between them, the circumstances of the case—that is, the character and relative importance of the river and the commerce dependent thereon, and the character and need of the bridge and the commerce dependent upon it—must be considered. For although Congress has, in effect, declared the Willamette River to be forever a "free" and "common highway," yet these terms are used with the implied understanding that the State has the power to bridge it, if it can do so without materially impeding the navigation.

What is such an impediment may be a difficult question to decide. It may depend much upon circumstances. A bridge of a certain character at a certain place may be of great benefit and convenience to a few people or some petty local trade or business, but a serious inconvenience or injury to many people and a valuable and extensive commerce.

The commerce of Oregon, both domestic and foreign, is largely dependent upon the free navigation of the Willamette River. Steamboats ply upon it most of the year for 100 miles or more south of Portland. At Portland the tide ebbs and flows, and from there to its mouth, a distance of 12 miles, it is navigated by sea and inland vessels, foreign and domestic, sail and steam, that go thence up and down the great Columbia, out upon the Pacific Ocean, and to all the principal ports of the world. It is the harbor of the Portland, the emporium and financial center of the Northwest, where the valuable products of the country are gathered from far and near and stored for market and exportation, and the imports from sister States and foreign countries are received and distributed throughout the interior.

In the near future we may expect a large increase of population at this place, and throughout the country with which it maintains business relations, and the commerce of Portland will demand the free use of the harbor and water front, as far south as it can be made useful.

The present need of a bridge is to furnish a more convenient and certain means of crossing the river than a steam ferry to the small population that live in East Portland and the neighboring villages, some portion of the passengers to and from Portland on the East Side Railway, the rural population that live on the narrow strip of country between East Portland and the Columbia River, and the transportation of their limited dairy and garden products to the Portland markets.

It is not intended by this statement to suggest that there is no need of a bridge across the river at this place, but only that the interests which may be promoted by it are as a drop in the bucket compared with those that may be seriously inconvenienced or injured by it.

With this brief sketch of the circumstances, I proceed to consider whether the act authorizing the building of the bridge is in conflict with the act of Congress declaring it a free and commercial highway.

The bridge is required to be built so "as not to injuriously impede and obstruct the free navigation of the river." But the defendant claims that the provision requiring the draw to be not less than 100 feet is equivalent to declaring that a draw of 100 is sufficient. My own impression is, that the act ought to be construed as authorizing a bridge which would not materially interfere with navigation, and, to this end, that the draw must be at least 100 feet, and as much longer as necessary, and that the defendant is not justified thereby in building a bridge with a draw of only 100 feet if that would materially interfere with the navigation. But if the construction claimed by the defendant is the correct one, it comes to the same thing in the end. The legislature of the State has not the power to say absolutely that a bridge may be built with only a draw of 100 feet, for if such a bridge interferes materially with the free navigation of the river, the act authorizing it is void, as being in conflict with the paramount law of Congress declaring the river a free and common highway. Therefore it is, that a bridge ought not to be attempted to be built across such a water as this, where so many and valuable interests are involved, without the sanction of Congress, given through the engineer department. The proper location and elevation of a bridge across the river at this place, and the length and place of draw—all the circumstances considered—are questions that more properly pertain to the political than the judicial department of the government.

There the matter may be "equitably adjusted," so to speak, according to the circumstances of each case. Here the court can only ascertain whether the proposed structure interferes materially with the free navigation of the river, and if it does it must declare it unlawful.

Accordingly, within the past fifteen years, Congress has been induced to legislate generally and specially upon the subject of bridges across the Mississippi and its tributaries. By the act of December 17, 1872 (11 Stat., 398), it is provided that no bridge can be built across the Ohio River without complying with the directions of that act, one of which is, that every bridge below the suspension one at Cincinnati shall have a high span of 100 feet above low water, with a space of 400 feet between the piers, and a pivot-draw with two clear openings of 160 feet each; and by act of April 1, 1872 (17 Stat., 44), a railway bridge was authorized across the Mississippi, near Clinton, Iowa, with a draw of not less than 160 feet, the same to be located, built, and kept subject

to the directions of the Secretary of War for the security of navigation, subject, even then, to be abated as a nuisance by a suit in the United States court, if it should prove an obstruction to the navigation of the river; and by the act of June 4, 1872 (17 Stat., 215), it is provided that all bridges thereafter built across the Mississippi by authority of Congress, shall be subject to the same direction and control of the Secretary of War.

By an act of July 25, 1866 (14 Stat., 244), Congress authorized the building of seven bridges across the Mississippi at different points above Saint Louis, and one across the Missouri at Kansas City, and provided that each of them should have two draw-openings of not less than 160 feet in the clear. By acts of February 24, 1871 (16 Stat., 430), and March 3, 1871 (Id., 473), bridges were authorized across the Missouri River at Omaha, Neb., and Louisiana, Mo., with two draw-openings of not less than 200 feet in the clear.

These citations of Congressional action might be multiplied greatly. (See report of Governeur K. Warren, U. S. A., Major of Engineers, on bridging the Mississippi between Saint Paul and Saint Louis, 1878, pp. 193–202.)

Indeed, Congress has spoken on the subject of bridging the Willamette at this place. By act of February 2, 1870 (16 Stat., 64), the city of Portland was authorized to bridge the river under the direction of the Secretary of War, so as "not to obstruct, impair, or injuriously modify the navigation" of the same. This act expired by its own limitation within six years, and nothing was done under it but an examination and approval of a plan by a Board of Engineers and the Secretary, December 30, 1872.

By this plan the bridge was located at the foot of Columbia street—1,820 feet above Morrison—and was to have a draw of 100 feet in the clear on each side of the pivot pier. And on June 23, 1874 (18 Stat., 281), Congress authorized the Oregon & California Railway Company to bridge the Willamette River at Portland, under the direction of the Secretary of War in all respects, except that the draw should be not less than 300 feet in width, so as "not to obstruct, impair, or injuriously affect the navigation of the same." Nothing has been done under this act, but it is still in force.

Taking these instances of Congressional action as a reasonable indication as to what is necessary in the construction of a bridge over this and other navigable waters of no more importance than this, and navigated with vessels of less tonnage, to prevent the navigation from being injuriously affected thereby, and weighing the testimony in the case, I think this bridge is such an obstruction to the navigation of the Willamette as prevents its being a free and common highway to the citizens of the United States, and is therefore a nuisance and unlawful. Indeed, I have no doubt of it. Forty-two persons, mostly navigators, including, I think, nearly all the pilots on the Columbia and Willamette rivers, testify unqualifiedly that the draw is too narrow and ought to be 200 feet instead of 100; and that in the winter season especially, the time when vessels usually load with grain for foreign ports, owing to the strong currents and high winds, it will be very unsafe to go through the draw with a good sized river steamboat, let alone a tug and sail vessel occupying a space from 70 to 80 feet.

The United States engineer in charge of the river and harbor improvements in this district, Col. George L. Gillespie, U. S. A., reports to the Chief of Engineers at Washington, on December 29, 1880, at length upon the subject of this bridge, and concludes that it should have been

located at Columbia street, but if allowed to be constructed at Morrison the draw should be enlarged to not less than 200 feet, and that a bridge there with a draw of only 100 feet will result in frequent loss to shipping, and may prevent sea-going vessels from going above the bridge altogether.

In reply to this mass of testimony the defendant has introduced six affidavits, one of them being from the contractor and another from the president of the company; only two of them being from river pilots.

The principal point made in them is that the bridge will be more dangerous to navigation if left in its present condition than if completed. But a sufficient answer to this is, that a court may require, by the injunction that the defendant undo what he has done amiss, as well as to refrain from so doing. (C. S. N. Co. *v.* V. & G. H. W. Co., 1 Saw., 482.)

In my judgment the preliminary injunction should be allowed. The defendant ought not to be permitted, against this showing, to place this structure in the river until its right to do so is definitely ascertained and determined. I am surprised that any person should have the hardihood to undertake such an important enterprise in the face of the act of February 14, 1859, *supra*, declaring the river a common highway, and the Congressional legislation of the last fifteen years upon the subject of bridging navigable waters of the United States, without first obtaining the sanction of Congress.

But this being a matter of some moment to the defendant, I have concluded to delay the issuing of the injunction until the first day of the next term, April 11, or as soon thereafter as the circuit judge is present, when the matter may be further heard if the defendant desires it; and in the mean time the defendant will be restrained by order, as prayed in the bill.

Todd Bingham, E. C. Bronaugh, and Edward Bingham, for the plaintiffs.

H. Y. Thompson and George H. Durham, for the defendant.

THE WILLAMETTE BRIDGE. OPINIONS OF JUSTICES SAWYER AND DEADY. THEIR VIEWS AS TO "OBSTRUCTING THE HARBOR."

United States circuit court, district of Oregon, Saturday, April 16, 1881.

Z. J. HATCH AND M. O. LOUNSDALE *vs.* THE WILLAMETTE BRIDGE COMPANY. } No. 675. Suit for an injunction.

Application for a preliminary injunction to restrain the defendant from unlawfully bridging the Willamette River at Portland.

Before Deady and Sawyer, *JJ.*

Report of the oral opinions of the judges allowing the application, from the notes of W. T. Hume.

(1.) INJUNCTION.—A preliminary injunction granted to restrain the erection of a bridge across the Willamette River at Portland contrary to the act of Congress (11 Stat., 383) declaring the navigable waters of the State free and common highways, at the suit of a riparian owner injured thereby.

(2.) OBSTRUCTION TO NAVIGATION.—Where Congress has declared a navigable river to be a common highway the State cannot authorize an obstruction therein, and anything which materially interferes with or limits the navigability thereof, considering the use which it is or may be subj-ct to, is an obstruction and a violation of such act of Congress, which the United States circuit court has jurisdiction, under the judiciary act of 1875 (18 Stat., 470), to prevent or abate by injunction.

DEADY, *J.:*

This application was first heard before me, sitting in this court alone, and on April 6 I delivered an opinion thereon, to the effect that the bridge where and as it was being constructed by the defendant was a serious obstruction to the navigation of the Willamette River, contrary to the act of Congress February 14, 1859, (11 Stat., 383), admitting the State into the Union, which declares that all the navigable waters of the State "shall be common highways and forever free" to all the citizens of the United States, and that this court, under sec. 1 of the act of March 3, 1875 (18 Stat., 470), giving it jurisdiction of a suit arising under the act of Congress, has authority to restrain parties from violating said act by obstructing the navigation of any of said waters at the suit of any one injured thereby.

But considering the importance of the matter to the defendant, I did not then direct the injunction to issue, but continued the application for further hearing upon the same and such additional evidence as the parties might produce, when the circuit judge, Mr. Justice Sawyer, should be present, and restrained the defendant, as prayed in the bill, in the mean time.

That hearing has been had, and the conclusion reached by his honor, the circuit judge, will now be announced by him.

As preliminary thereto, I merely wish to say for myself that the further thorough investigation of this question and able argument of the case pro and con, has only deepened my conviction that the proposed bridge is and will be a nuisance and serious impediment to the navigation of this river.

The law of the case, upon which the contention mainly turned upon the first hearing, is now admitted by the defendant to be correctly stated in the opinion then delivered by myself.

The only remaining question for consideration is, will the erection of this bridge seriously impair or affect the navigability of the river? If it appears probable that it will, the defendant ought not to be allowed to proceed further in the commission of the wrong. It has been well said by some scientific authority upon this subject, that any bridge is a serious obstruction to the navigation of a river, which can be essentially improved.

Upon the evidence and in the very nature of things there can be no doubt that this bridge, where and as it is being constructed, is a serious obstruction to the navigation of the river.

It will absolutely obstruct the navigation of the river, except for the space of 100 feet on either side of the pivot pier, and these openings are altogether too narrow to admit the safe and convenient passage of the sea-going vessels that come to this port, or even the larger class of river boats, except in favorable conditions of wind and water.

Indeed the further investigation of this matter makes it appear very probable to my mind that no bridge, unless it be a suspension one, can be constructed over the river at this point, without being a serious obstruction to its navigability and impairing its usefulness as a common highway for the citizens of the United States.

The Willamette River in front of Portland is not only a navigable

stream with a ship channel; it is also a sea-port, the harbor, as I have before said, of "the emporium and financial center of the northwest," and to all appearance is destined to be second to no city in importance on the Pacific coast, save one.

Probably nine-tenths of the exports produced west of the Rocky Mountains and north of the 42d parallel are gathered here for sale and shipment abroad upon sea-going vessels of, in some cases, 3,000 tons burden.

Every bushel of grain grown for export over this vast region, and particularly in the great Willamette Valley, feels the cost of storage and dockage at this port, and anything which limits or restricts the capacity or convenience of its harbor, works a direct injury to the great body of the producers throughout the country.

Therefore it is that the convenience of the comparatively small population immediately east of Portland, or even in Portland, is not alone to be considered in this matter.

The river is the navigable water of the people of the United States, and the harbor is for the free use of all the people whose exports and imports freight the vessels that frequent it from all parts of the world.

At this point, on the west bank of the river, the ox teams of the Willamette Valley first met the sea-going vessel, and the traffic between them was the beginning of Oregon's commerce. Out of this commerce grew the town of Portland. But destroy, or materially restrict, or impede the free use of this harbor, or the approaches to it, and so far you destroy the town and injure the commerce of the country. The injunction ought to be allowed.

SAWYER, *J.*:

I have very little to add to what the district judge has said. I fully concur with him in the conclusions that he has reached.

It is very clear that under the admitted law of the case, the act admitting the State into the Union, which provides that the navigable waters of the State shall be free and common highways, and in the view of the decision of the Supreme Court in the Wheeling Bridge case (13 How., 518), in which it was held, under a similar act, that any obstruction to the navigation of the Ohio River was unlawful except by the consent of Congress; and the judiciary act of March 3, 1875, giving this court jurisdiction of a suit arising out of an act of Congress, that this court has authority to restrain the defendant from placing any obstruction in this river which will obstruct its navigation.

The only remaining question then is whether the bridge now being constructed by the defendant will be such an obstruction. To my mind the testimony clearly indicates that the bridge is and will be an unlawful obstruction to navigation, and, I think, this must be apparent to every person familiar with the subject, or even of general intelligence. If it is at all a material obstruction it comes within the inhibition of the statute and is unlawful.

It was argued by counsel for the defendant that the commerce of the country is not all carried on up and down, or upon the river, and that the commerce and convenience of the people which cross it must be taken into consideration in determining the propriety of bridging it. It may be of importance to the cities upon either bank of the river that they should have communication by means of a bridge, but these are considerations to be addressed to another tribunal than this court. They should be addressed to Congress, where, upon an application for per-

mission to bridge the river, these conflicting interests can be considered and adjusted, as may be thought best for the public good.

But this court must simply ascertain whether the bridge will be a material obstruction to the navigation of the river. It cannot balance these conflicting interests and determine that the one will be more benefited by the bridge than the other will be injured thereby. Its power is confined to the determination of the question whether it will be a material obstruction to navigation or not.

In the Wheeling Bridge case the obstruction caused by the bridge as compared with the benefit was exceedingly small. That suit was commenced in 1849, when the commerce on the Ohio was more limited than now, and the bridge was a connecting link in a great public highway, by rail and otherwise.

The referee reported that of all the steamboats then running on the river only nine were prevented from passing the bridge an account of the great height—from 63½ to 80 feet—of their "chimneys," and they for only a few days in the year, and, although these chimneys might have been shortened or lowered when passing the bridge by means of hinges, and although the benefit resulting to navigation in the increased draught given by such tall chimneys must have been small in comparison to the benefit to commerce resulting from the bridge, yet the latter was determined to be a violation of the act of Congress declaring the navigation of the river "free and common to the citizens of the United States," and the court ordered it abated as a nuisance. As I said during the hearing, it appears from the evidence that the draw is too narrow to admit the passage of the larger vessels that come here, and on that account the bridge is an obstruction to navigation; and I am satisfied that the further investigation of the subject will make this more apparent. But I am also satisfied that this bridge, whatever the width of the draw, will be an obstruction, if erected in the midst of this harbor.

In the course of the argument the question was asked of counsel: "Would not even these piers, without a bridge upon them, standing where they are, be regarded as a nuisance, and have to be removed?"

Now, the fact that you put a bridge upon them does not render them any the less an obstruction, but more so.

Located as it is, right in the midst of the harbor, where vessels are required to move constantly from place to place, without a passage, except at the single point of this draw, the bridge will be a serious obstruction to navigation in the harbor, even if the draw was sufficient for the passage of vessels up and down the stream.

The act of Congress does not limit the free navigation of the river to a particular part or channel, but it declares the whole river a free and common highway to the full extent of its capability of navigation.

A bridge may not be a material obstruction to the navigation of a river if erected at a point where vessels simply pass up and down the channel on their way to and from a port. But in the case of a harbor like this, the location, surroundings, and circumstances must be considered, and they may require that no part of it be obstructed or closed to navigation. In this view of the matter, I think that any bridge in this harbor would necessarily be such an obstruction to its navigation as to require the consent of Congress to justify it.

This place is a commercial center, the second port in importance on the Pacific coast, mainly because ocean vessels of a large size can come to its docks.

Therefore it is a serious question whether the people of Portland or the State of Oregon can afford to allow a bridge to be built in the midst

of this harbor, at a point where ships must congregate, and thereby create such an obstruction therein as may, and probably will, turn the commerce of the city in other channels.

This harbor is not large, and when the shipping here is much increased, as it doubtless will be with the growth of the country and the place, there will be no room to spare in it.

Ships often remain in the harbor of San Francisco three or four months waiting employment, but they could not afford to incur the expense of lying at the docks all this time. They pay wharfage a few days while at the docks discharging or taking in cargo, and in the mean time draw out into the stream, where they can lay without expense.

All the navigable waters of this harbor will be needed for the use and accommodation of shipping. In San Francisco, where a large portion of the shipping lies out in the stream, my recollection, from judicial investigation, is that a clear passage-way of 600 feet or yards—I think the latter—from the end of the wharves is always kept open; and even then collisions often occur, as the records of the courts there will show.

All these things are to be considered in determining whether it is good policy, even if Congress could be brought to consent to it, to bisect this harbor with a bridge that would render it unnavigable along its line, except at a particular point.

But when we consider the commerce of the city, the size of the harbor, and the character of the vessels that come to the port, we think the erection of this bridge will prove a great obstruction to the navigation of the river, both on account of the insufficiency of the draw, and generally considered as a bridge, and therefore be injurious to the plaintiffs; and, so considering, we feel bound to grant this injunction.

Objection has been made that the plaintiffs have been guilty of delay in applying for this preliminary injunction. There are cases in which such an objection has force, but it does not apply here. This is a matter in which a large number of people are interested, and usually what is everybody's business is nobody's business. It is a large task for any one man to undertake to conduct a litigation against a large company, and it is one he would not undertake unless he was compelled to.

It is alleged in the bill, and the evidence shows that the plaintiffs have actually been compelled to sue, because the owners of vessels have refused to take them to their wharves, on account of the danger of passing this construction, even in its present condition, when there is something more than the mere draw to go through. And they may not have been aware of the extent that the bridge would prove an obstruction until it was so developed and shown. The bill was filed in January, and I think there has been no great delay, the circumstances considered.

Another satisfactory answer to this objection is the fact that, upon the evidence now in the case, or that is ever likely to be, and the knowledge which is open to every one, that in all probability this injunction must be finally sustained.

If the injunction is not now issued, and the defendant is allowed to go on and finish the bridge before the final determination of this suit, it would then have to be removed, if the court so adjudged, as it probably would, unless Congress in the mean time should see fit to authorize it, as it did the Wheeling bridge, which, considering the character of the obstruction, is not at all probable.

The amount of the bond to be given by the plaintiffs I will leave to be settled before the District Judge.

DEADY, *J.:*

For the convenience of parties, I now say that I think the bond ought to be given in a sum not exceeding $25,000, and that unless cause is shown to the contrary, the order of the court will be that the injunction issue upon the plaintiffs giving bond in that sum, with sufficient sureties, to be executed before and to the satisfaction of the master of this court, Mr. William B. Gilbert.

Hugh T. Bingham, Edward Bingham, and E. C. Bronaugh for the plaintiffs.

H. Y. Thompson, W. Lair Hill, and Byron B. Bellinger for the defendant.

NOTE.—Judge Sawyer heard the cause finally and made the injunction perpetual, and further ordered defendant to forthwith take all piers, &c., out of the river.

See decree, Oct. 22, 1881.

E. W. B.,
Attorney.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 163.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING,

In compliance with Senate resolution of June 16, 1882, *estimates of the amounts required to pay the claims referred to, &c.*

JUNE 22, 1882.—Referred to the Committee on Appropriations and ordered to be printed.

NAVY DEPARTMENT,
Washington, June 21, 1882.

SIR: I have the honor to acknowledge the receipt of a resolution passed by the Senate on the 16th instant, requesting information as to

What amounts are required for the pay of officers of the Marine Corps, in accordance with the decision of the Supreme Court in the case of United States *vs.* Tyler; also, what amounts are required to pay unadjusted claims of naval officers for mileage, in accordance with the decision of said court in the case of United States *vs.* Temple.

In compliance with the resolution I transmit herewith estimates of the amounts required to pay the claims referred to, which were prepared by the Fourth Auditor of the Treasury and reported to this department on the 20th instant, a copy of which report is respectfully submitted.

I have the honor to be, very respectfully, your obedient servant,

J. E. WALKER,
Acting Secretary of the Navy.

Hon. DAVID DAVIS,
President of the Senate pro tempore.

TREASURY DEPARTMENT, FOURTH AUDITOR'S OFFICE,
June, 20, 1882.

SIR: I have the honor to acknowledge the receipt of your letter of the 19th instant, inclosing a copy of a resolution passed by the Senate on the 16th instant, and in answer to your request I have to state that I estimate the amount required to pay officers of the Marine Corps having claims under the decision in the "Tyler case" at $25,000.

Of claims for mileage under the decision in the "Temple case" and coming under section 4, act of June 14, 1878, one hundred and sixteen have been reported to Congress, amounting to $31,389.94, and since they were reported twenty-one have been settled and are now ready to report, amounting to about $5,397.59. Of this class of claims about sixty

are now on hand unsettled, and it is estimated that about $20,000 will be required to cover them.

One hundred and sixty-seven claims, for which money is available, have been settled, amounting to $37,483.07. Sixty-eight are on hand unsettled, for which at least $17,000 should be estimated.

I am quite unable to form any trustworthy opinion as to the number of claims that may yet be presented, or how much will be required to meet them; they are now being received at an average of five daily, and those settled average about $250 each.

Very respectfully, your obedient servant,

CHAS. BEARDSLEY,
Auditor.

Hon. WILLIAM E. CHANDLER,
Secretary of the Navy.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 164.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A petition from First Lieut. G. S. Jennings, U. S. A., retired, for such legislation as will give him the rank and pay of colonel on the retired list from date of retirement from active service, &c.

APRIL 26, 1882.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT,
Washington City, April 25, 1882.

The Secretary of War has the honor to transmit to the United States Senate a petition from First Lieut. Gilbert S. Jennings, United States Army, retired, for such legislation as will give him the rank and pay of colonel on the retired list from the date of his retirement from active service, June 28, 1878, together with a report from the Adjutant-General of the Army dated the 20th instant, and accompanying papers in the case.

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT *pro tempore*
of the United States Senate.

To the honorable the Senate and House of Representatives of the United States of America:

GENTLEMEN: Your petitioner would respectfully represent that under the call of the President of the United States, and orders of the governor of the State of New York, in April, 1861, your petitioner enlisted a company of volunteers at Rochester, N. Y.; that on May 2, 1861, he received orders, as captain of said company, to proceed to Elmira, N. Y., with his company, where it was incorporated with the Twenty-sixth Regiment New York Volunteers; that on the 15th May, 1861, he was promoted to be major of said regiment; that the regiment was mustered into the service of the United States on the 21st May, 1861, at Elmira, N. Y., and was mustered out of service at Utica, N. Y., on May 28, 1863.

On September 17, 1862, your petitioner was promoted to be lieutenant-colonel of said regiment; that your petitioner, while in command of the regiment (the colonel being absent on leave), in action at the battle at Fredericksburg, Va., December 13, 1862, was severely wounded and incapacitated for active field service; that he was honorably mustered out of service with the regiment May 28, 1863.

On the 16th July, 1863, he was appointed major in the Veteran Reserve Corps, and on the 25th September, 1863, he was promoted to be lieutenant-colonel of the Eleventh Regiment of said corps, and colonel by brevet March 13, 1865, "for gallant and meri-

torious services during the war," and was honorably discharged September 11, 1866. On the 22d January, 1867, he was appointed second lieutenant Forty-third Infantry, Veteran Reserve Corps; first lieutenant by brevet March 2, 1867, "for gallant and meritorious service in the battle of Groveton, Va."; captain by brevet March 2, 1867, "for gallant and meritorious service in the battle of Fredericksburg, Va."; transferred to the First United States Infantry, on the reduction of the Army, April 8, 1869.

Your petitioner being incapacitated, by wounds received in battle, from service in a regiment in active service, made application to be retired, and on the 19th August, 1870, was ordered to appear before the retiring board at Fort Leavenworth, Kans.; that he did so on the 1st October, 1870, and the report of the board on his case, which is on file in the office of the Adjutant-General of the Army, he believes will show that the board found him eligible for retirement on the rank of colonel, under section 32 of the act of Congress of July 28, 1866, which is as follows: "That officers of the regular Army, who are entitled to be retired on account of disability occasioned by wounds received in battle, may be retired upon the full rank of the *command* held by them, whether in the regular or volunteer service, at the time such wounds were received." (14 Stat., 337.)

Your petitioner fully expected that he would be placed on the "retired list" in accordance with the report of the board in his case; but, on the contrary, he believes a great injustice was done him in retaining him on the active list of the Army until the said section 32 of the act of July 28, 1866, had been repealed.

Your petitioner is led to believe, from the statement in the communication from the Secretary of War to the United States Senate, under date of December 20, 1872, in compliance with their resolution of December 5, 1872, (Senate Executive Document No. 19, Forty-second Congress, third session), that your petitioner was the *only* one who was legally and equitably eligible to be retired, under the provisions of section 32 of the act approved July 28, 1866, upon whose case no action was had prior to the repeal of the said act in 1872.

Your petitioner was therefore kept in service in an active regiment until June 28, 1878, when he was retired "upon the report of the board" in his case of October 1, 1870—over seven years after said report was rendered—and was retired as a first lieutenant of infantry.

Your petitioner applied to the Adjutant-General of the Army by letter, to know, if there was no intentional persecution of him, what was the reason of the delay in action upon the report of the board in his case, as had he not been coerced out of his legal right he would have been retired as colonel; the Adjutant-General replied (December 8, 1879) "that neither at the time you were found incapacitated for active service, nor at any time between that date and June 10, 1872, were there enough vacancies on the retired list to permit the retirement of all officers who were legally eligible, and the President, in the exercise of the discretion allowed him by law, selected other officers who were eligible for retirement to fill all the vacancies that occurred."

Your petitioner would respectfully invite your attention to the foregoing, in view of the fact that of those officers ordered to appear before boards for examination for retirement, *subsequent* to the report of the board in his case, *twenty-one* were retired prior to January 1, 1871, plainly showing the fact that your petitioner *was* coerced out of a legal right which was granted to so many others by the prerogative of the President.

Your petitioner would state, that by paragraph 1, of General Orders No. 96, War Department, Adjutant-General's Office, July 26, 1870, "officers who wish to avail themselves of the provisions of sections 3 and 4 of the act are desired to apply for discharge or retirement at the earliest day practicable; and to accompany their application with a statement of reasons and circumstances which may serve accurately to determine their cases." In obedience to said order your petitioner *did* so apply, was ordered to appear before a retiring board, did so appear, and the report of the board will show that he was found eligible to be retired as colonel, having been lieutenant-colonel in command of a regiment, in action, when disabled—thereby entitling him to be retired upon the rank of colonel, by section 32 of the act of July 28, 1866. The delay in the action upon the report of the board in his case he claims is an injustice not contemplated by Congress when the law was enacted, and your petitioner therefore prays for relief from said injustice, and that he may be placed on the retired list of the Army with the rank to which he was entitled by the report of the board in his case, and to date from June 28, 1878, when he was retired as a first lieutenant.

And your petitioner will ever pray, &c., &c.

GILBERT S. JENNINGS,
First Lieutenant and Brevet Captain, U. S. A., Retired,
No. 9 Washington Avenue, Detroit, Mich.

ADJUTANT-GENERAL'S OFFICE,
April 20, 1882.

SIR: I have the honor to submit herewith a petition to Congress, in duplicate, from First Lieut. Gilbert S. Jennings, United States Army, retired, for such legislation as will give him the rank and pay of colonel on the retired list from the date of his retirement from active service, June 28, 1878, with accompanying letter to the Secretary of War requesting that the petitions be forwarded to the Senate and House of Representatives, respectively.

Gilbert S. Jennings first entered the United States service as major Twenty-sixth New York Volunteers, May 21, 1861; was promoted to lieutenant-colonel in that regiment December 1, 1862, and was honorably mustered out May 28, 1863. He was appointed major in the Veteran Reserve Corps (volunteers) in July, 1863, and lieutenant-colonel in September, 1863, and was finally mustered out of the volunteer service as lieutenant-colonel September 11, 1866. He received an appointment as second lieutenant, Forty-third United States Infantry, March 28, 1867; was transferred to the First Infantry April 8, 1869, and was promoted to first lieutenant May 4, 1873. In May, and again in August, 1870, Lieutenant Jennings, then a second lieutenant, applied to be ordered before a retiring board with a view to retirement on account of wounds received December 13, 1862, when in the volunteer service. In forwarding the first application, General P. St. George Cooke, commanding the department in which Lieutenant Jennings was serving, remarks that the department inspector had "reported as his opinion that Second Lieutenant Jennings is too old for active service as a subaltern, and should be ordered before a retiring board when it is practicable to do so." It may be stated that Lieutenant Jennings was nearly fifty years old when appointed a second lieutenant in 1867. He was ordered before a retiring board, and was examined October 1, 1870. The board reported that, in its judgment, Lieutenant Jennings "is incapacitated for active service in consequence of a gunshot wound in the right leg, received in the line of duty at the battle of Fredericksburg, Va., December 13, 1862, whilst holding the rank of lieutenant-colonel Twenty-sixth NewYork Volunteer Infantry, and in actual command of said Twenty-sixth Regiment New York Volunteer Infantry, and that said wound entirely disables him from marching."

At this time, however, there were not vacancies enough on the retired list—which was limited by law to 300—to allow the retirement of all officers who were eligible therefor, and as the rank of Lieutenant Jennings was of the lowest grade of commissioned officers in the Army, his retirement was deferred so as to enable the President to retire officers in the higher grades. Meantime Lieutenant Jennings returned to duty, and before any action as to his retirement had been taken the act of July 28, 1866, section 32, authorizing the retirement of officers with higher rank, was repealed. Section 32 of this act (Stats. 14, p. 337) provided: "That officers of the regular Army entitled to be retired on account of disability occasioned by wounds received in battle may be retired upon the full rank of the command held by them, whether in the regular or volunteer service, at the time such wounds were received." This law was repealed by the act of June 10, 1872 (now section 1254 Rev. Stats.), which provided "that all officers of the United States Army who may hereafter be retired shall be retired upon the *actual rank held by them at the date of retirement.*"

In February, 1873, Lieutenant Jennings made a request that his name be dropped from the list of applicants for retirement, presumably for the reason that he would soon become entitled to promotion to first lieutenant, and subsequently, in April, 1875, he applied for retirement with the rank of lieutenant-colonel, under the mistaken view that he could be retired with that rank under the provisions of section 2, act of March 3, 1875. That act, a copy of which is herewith, operated to reduce the rank of certain officers who had been retired under the act of July 28, 1866, with the rank of *the command* held by them when wounded, and who did not belong to the class specified in the act of March 3, 1875, as exempt from reduction, to the *actual rank* they held when wounded. Had it been practicable to retire Lieutenant Jennings prior to the repeal of section 32 of the act of July 28, 1866, and had he received the rank of colonel on the retired list under that act, the act of March 3, 1875, would have operated to reduce him to the *actual rank* he held when wounded, that of lieutenant-colonel. He was retired June 28, 1878, with a number of other lieutenants who had long been awaiting vacancies on the retired list, after the passage of the act of June 18, 1878, increasing the number of officers allowed on the retired list from 300 to 400.

A statement of Lieutenant Jennings' military services is herewith inclosed.

Very respectfully, your obedient servant,

R. C. DRUM,
Adjutant-General.

The honorable SECRETARY OF WAR.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, April 20, 1882.

Statement of the military service of Gilbert S. Jennings, of the United States Army, compiled from the records of this office.

VOLUNTEER RECORD.

Entered the service May 21, 1861, as major Twenty-sixth New York Volunteers, and promoted lieutenant-colonel December 1, 1862.

Service.—With regiment to September —, 1861; on recruiting service to December —, 1861; with regiment to March —, 1862; on recruiting service to May —, 1862; with regiment, until wounded in action at Fredericksburg, Va., December 13, 1862, while lieutenant-colonel; absent on account of wounds to May 28, 1863, when he was mustered out of service with his regiment.

Appointed major Veteran Reserve Corps July 16, 1863.

Appointed lieutenant-colonel Veteran Reserve Corps September 25, 1863.

Assigned to Eleventh Regiment Veteran Reserve Corps; (brevetted colonel March 13, 1865, for gallant and meritorious services during the war.)

Service.—On detached service at Buffalo and Elmira, N. Y., to March —, 1864; with regiment at Camp Douglas, Ill., Alexandria, Va., Point Lookout, Md., Albany, N. Y., and Louisville, Ky., to July —, 1865; on duty at draft rendezvous, Louisville, Ky., to September 11, 1866, when mustered out of service.

REGULAR ARMY RECORD.

Appointed second lieutenant Forty-third Infantry 22d January, 1867; transferred to First Infantry 8th April, 1869.

Promoted first lieutenant First Infantry 4th May, 1873; retired 28th June, 1878.

(Brevetted first lieutenant 2d March, 1867, for gallant and meritorious services in the battle of Groveton, Va., and captain 2d March, 1867, for gallant and meritorious services in the battle of Fredericksburg, Va.)

Service.—With regiment in Michigan from April —, 1867, to September 20, 1870; before retiring board at Fort Leavenworth, Kans., to October 11, 1870; with company at Fort Brady, Mich., to November 8, 1870; on leave to January 2, 1871; with company at Fort Porter, N. Y., to June 19, 1871; Fort Wayne, Mich., to May 30, 1873; Madison Barracks, N. Y., to June 16, 1874; Fort Sully, Dak., to May 14, 1876; and Fort Rice, Dak., to June 10, 1876; on sick-leave and surgeon's certificate of disability until retired June 28, 1878.

R. C. DRUM,
Adjutant-General.

[General Orders No. 16.]

WAR DEPARTMENT,
ADJUTANT-GENERAL'S OFFICE,
Washington, March 8, 1875.

The following acts of Congress are published for the information and government of all concerned:

I. AN ACT for the relief of General Samuel W. Crawford, and to fix the rank and pay of retired officers of the Army.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the retirement as a colonel, on February nineteenth, eighteen hundred and seventy-three, for disability on account of a wound received in battle, of Bvt. Maj. Gen. S. W. Crawford, United States Army, be, and the same hereby is, so amended that the said Crawford shall be retired and be borne on the retired list of the Army as a brigadier-general, he having held the rank of brigadier-general at the time he was wounded: *Provided,* That his retired pay as brigadier-general shall commence from the passage of this act.

SEC. 2. That all officers of the Army who have been heretofore retired by reason of disability arising from wounds received in action shall be considered as retired upon the actual rank held by them, whether in the regular or volunteer service, at the time when such wound was received, and shall be borne on the retired list and receive pay hereafter accordingly; and this section shall be taken and construed to include those now borne on the retired list placed upon it on account of wounds received

in action: *Provided*, That no part of the foregoing act shall apply to those officers who had been in service as commissioned officers twenty-five years at the date of their retirement; nor to those retired officers who had lost an arm or leg, or has an arm or leg permanently disabled by reason of resection, on account of wounds, or both eyes by reason of wounds received in battle; and every such officer now borne on the retired list shall be continued thereon notwithstanding the provisions of section two, chapter thirty-eight, act of March thirty, eighteen hundred and sixty-eight; and be it also provided that no retired officer shall be affected by this act, who has been retired or may hereafter be retired on the rank held by him at the time of his retirement, and that all acts or parts of acts inconsistent herewith be, and are hereby, repealed.

Approved March 3, 1875.

II. AN ACT for the relief of Major N. H. McLean, late of Adjutant-General's Department, United States Army.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President be, and is hereby, authorized to appoint Major Nathaniel H. McLean, late of the United States Army, to fill the first vacancy which may occur in the lowest grade of the Adjutant-General's department, or if he shall deem it best, to reinstate and retire him with the rank to which he would have attained in service at the date of the passage of this act.

Approved March 3, 1875.

By order of the Secretary of War:

E. D. TOWNSEND,
Adjutant-General.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 165.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING,

In response to Senate resolution of April 18, 1882, *a report of the Secretary of State, with copies of certain diplomatic correspondence with Spain in* 1876.

MAY 3, 1882.—Read and referred to the Committee on Foreign Relations and ordered to be printed.

To the Senate of the United States:

I transmit herewith, in response to the resolution of the Senate of the 18th instant, a report of the Secretary of State, with copies of certain diplomatic correspondence with Spain in 1876, called for by that resolution.

CHESTER A. ARTHUR.

EXECUTIVE MANSION,
Washington, May 2, 1882.

To the President:

The Secretary of State has the honor to acknowledge the receipt of the resolution of the Senate, dated the 18th day of April, 1882, which was referred to him, and which is worded as follows:

Resolved, That the President of the United States be, and he is hereby, requested to transmit to the Senate, if, in his opinion, not incompatible with the public interest, a copy of the diplomatic correspondence which passed in the early part of 1876 between the United States minister in Madrid and the Spanish secretary of state, as follows:

First. Memorandum of certain cases of citizens of the United States condemned to death in Cuba, &c., handed by the United States minister to the Spanish secretary of State on the 31st of January, 1876.

Second. Note of the Spanish secretary of state to the minister of the United States, dated Madrid, January 31, 1876, acknowledging the receipt of the foregoing memorandum.

Third. Note of the same secretary of state, dated Madrid, February 9, 1876, and addressed to the minister of the United States.

Fourth. Note of the same date, February 9, 1876, from the minister of the United States to the Spanish secretary of state.

The Secretary of State has the honor to lay before the President copies of the four documents described in the above and foregoing resolution.

FREDK. T. FRELINGHUYSEN.

DEPARTMENT OF STATE,
Washington, April 29, 1882.

LIST OF ACCOMPANIMENTS.

1. Memorandum of confiscation cases, handed to the minister of state of Spain, January 31, 1876.
2. Note of Mr. Calderon y Collantes to Mr. Cushing, January 31, 1876. Translation.
3. Note of Mr. Calderon y Collantes to Mr. Cushing, February 9, 1876.
4. Note of Mr. Cushing to Mr. Calderon y Collantes, February 9, 1876.

[Appendix A in No. 818.]

Memorandum of confiscation cases handed to the minister of state January 31, 1876.

(Copy.)

Memorandum of certain cases of citizens of the United States condemned to death in Cuba while in the United States, or now under charge, for acts or words of *infidencia* charged (falsely) to have been committed or uttered in the United States, with confiscation of property.

Joaquin Dalgado, Ramon Fernando Criado y Gomez, Antonio Mora, Magdalena Farrés de Mora.

1. The three persons first named are included in a sentence of November 8, 1870, condemning to death fifty-four persons *en masse*. The fourth is the wife of one of the three, under process but not yet sentenced, and her property is under seizure.

2. The three citizens of the United States named were condemned on the *report* only of being members of the Cuban junta, or, as the principal witness says, "spoken of as members of the junta, or at least auxiliaries and friends of the same."

3. A similar charge is made against Mrs. Mora, but is also false.

4. These four cases are of the class of condemnations which his excellency Mr. Calderon y Collantes, in his note of November 15 last, admits to be in flagrant violation of justice and of the rights of the United States.

5. The undersigned respectfully suggests that the prompt solution of these four cases of crying injustice, of four years' standing, will constitute a decisive step in the direction of peaceful relations between the United States and Spain.

Legation of the United States of America, Madrid, January 31, 1876.

C. CUSHING.

[Appendix C in No. 818.—Translation.]

Mr. Calderon y Collantes to Mr. Cushing.

MINISTRY OF STATE,
Palace, January 31, 1876. (Received February 1, 1876.)

EXCELLENCY, SIR: I have received the memorandum which, under date of to-day, your excellency has been pleased to address to me relative to several sentences in causes of *infidencia* pronounced against citizens of the United States, and embargo of their properties in Cuba.

So soon as I shall have acquainted myself with the antecedents of this affair I shall have the honor to bring to your excellency's knowledge the resolution of the government, improving meanwhile this occasion to reiterate to your excellency the assurances of my most distinguished consideration.

FERN'DO CALDERON Y COLLANTES.

Señor MINISTER PLENIPOTENTIARY OF THE UNITED STATES.

[Appendix F in No. 818.—Translation.]

Mr. Calderon y Collantes to Mr. Cushing.

MINISTRY OF STATE,
Palace, February 9, 1876. (Received February 9, 1876—2 p. m.)

EXCELLENCY, SIR: On the 31st of January last I had the honor to acknowledge reception of the memorandum which, under the same date, your excellency was pleased

to address to me in reference to the process and condemnation of the American subjects, Joaquin Delgado, Ramon Fernandez, Criado y Gomez, Antonio Mora, and Magdalena Farrés de Mora.

I have now the satisfaction to inform your excellency that the government of His Majesty, accepting as sufficient proof of the nationality of those persons the data set forth by your excellency's communication dated the 6th instant, seeing that the Spanish laws do not concede to the executive power the right of annulling sentences made executory, has resolved to remit and pardon the penalty which was imposed on the above-named subjects of the United States by the ordinary council of war, and in consequence thereof to command that there be immediately raised the confiscation or embargo of their property which may have been decreed, leaving it at their free disposal.

This resolution of the government of His Majesty is communicated this very day by telegraph to the superior authorities of Cuba, and your excellency may rest assured that it will be faithfully executed.

The government of His Majesty hopes that in this resolution that of the United States will see a proof of the sincerity with which Spain desires to attend, with justness and promptness, to all the reclamations addressed to it, and of its earnest care in maintaining friendly relations with all foreign governments, removing, for its part, whatever obstacles may oppose themselves to this satisfactory result so convenient for all.

I improve this opportunity, &c.

FERN'D CALDERON Y COLLANTES.

Señor MINISTER OF THE UNITED STATES.

[Appendix G, No. 818.]

Mr. Cushing to Mr. Calderon y Collantes.

LEGATION OF THE UNITED STATES,
Madrid, February 9, 1876.

SIR: It has afforded me lively satisfaction to receive your excellency's note of this date, communicating to me the prompt resolution of His Majesty's government in the matter of the confiscated property of certain citizens of the United States which had been so long unattended to by previous governments.

I have already transmitted information thereof to my government by telegraph, and shall dispatch the correspondence on the subject by mail, not doubting that the President of the United States will duly appreciate the friendly purposes and good faith manifested in this respect by His Majesty's government.

I avail, &c.

C. CUSHING.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 166.

LETTER

FROM

THE SECRETARY OF THE INTERIOR,

TRANSMITTING

A communication and estimate from the Director of the United States Geological Survey, giving desired information called for in Senate resolution of April, 1882, relating to the progress made by the United States Geological Survey of the Territories towards an examination into the mineral and agricultural and other economic resources of that region known as Alaska, &c.

MAY 4, 1882.—Referred to the Committee on Territories and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, May 3, 1882.

SIR: Referring to the resolution of the Senate, passed on the 18th ultimo, requesting the Secretary of the Interior "to furnish to the Senate such information as he may have as to the progress made or to be made by the United States Geological Survey of the Territories towards an examination into the mineral and agricultural and other economic resources of that region known as Alaska, and also to make to the Senate an estimate for the speedy undertaking and completion of such an examination, and also to inform the Senate whether the survey of said Territories is not within the class of work belonging to the United States Geological Survey of the Territories," I have the honor to inclose herewith a letter from the Director of the United States Geological Survey giving desired information and estimate.

Very respectfully,

H. M. TELLER,
Secretary.

The PRESIDENT OF THE SENATE *pro tempore.*

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,
Washington, D. C., April 26, 1882.

SIR: In compliance with your instructions I have the honor to submit the following statement in relation to the information called for in the Senate resolution of April 18, 1882, viz:

IN THE SENATE OF THE UNITED STATES,
April 18, 1882.

Resolved, That the Secretary of the Interior be directed to furnish the Senate of the United States such information as he may have as to the progress made or to be made by the United States Geological Survey of the Territories towards an examination into the mineral and agricultural and other economic resources of that region known as Alaska, and also to make to the Senate an estimate for the speedy undertaking and completion of such an examination, and also to inform the Senate whether the survey of said Territories is not within the class of work belonging to the United States Geological Survey of the Territories.

Attest:

F. E. SHOBER,
Acting Secretary.

Up to the present time the operations of the United States Geological Survey have not been extended into Alaska, though such extension has been deemed desirable. The mining industries of the United States during the last decade have grown to great proportions. Under these circumstances, there is a constant and pressing demand in various portions of the country, where mining in gold, silver, coal, iron, lead, zinc, &c., is prosecuted, that a geological survey should be made of the several districts interested. The appropriations made by Congress for this work are extremely limited in comparison with its extent and importance. It has therefore been thought best not to enter the field of Alaska until some of these more urgent wants have been met.

There are many important reasons why the survey of Alaska should now be commenced. We have as yet but a vague knowledge of the mining, agricultural, and other resources of that region. It is believed that there is some agricultural land, and it is known that coal, iron, gold, silver, copper, and other minerals are found, but their extent is unknown. In a portion of the country there is valuable timber, and the fisheries of the region have now become of great importance. The entire area is public land, and soon the attention of emigrants from the more settled portions of the United States will be called to this region.

For such reasons the geography and geology of the country should be speedily known and its natural resources portrayed.

In reply to the last inquiry of the resolution, it should be stated that the Geological Survey is organized for the specific purpose mentioned in the resolution.

To comply with the following requirement of the resolution, viz, "to make to the Senate an estimate for the speedy undertaking and completion of such an examination," I would recommend that an estimate for $25,000 be made for this work. For a smaller amount the work could not properly be commenced. For that sum the proper scientific corps could be employed, transported, subsisted, and furnished with necessary instruments.

It perhaps would not be wise to commence the work on a larger scale, from the fact that for the first year the operations would to some extent be experimental in determining the best methods of survey and the instruments and material necessary. By reason of the peculiar topography and climate, the methods of survey and research must to some extent differ from those prosecuted in other portions of the national domain.

That portion of Alaska of immediate interest is the Alexander Archipelago and adjacent mainland lying to the west of British Columbia and extending from the southern extremity of Alaska, north and westward, to Mount Saint Elias. This is the district which should be first surveyed, because of its immediate importance. The archipelago is composed of a great number of islands—how many is not known. The

mainland is a narrow strip extending from the ocean shore back to the crest of the mountains.

The appropriation above suggested would be sufficient for the first year, but to complete the work it would be necessary to continue it for several years, probably five or six.

I am, with respect, your obedient servant,

J. W. POWELL,
Director.

Hon. SECRETARY OF THE INTERIOR.

47TH CONGRESS, 1st Session. } SENATE. { Ex. DOC. No. 167.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

Papers relating to the necessary enlargement of the military reservation of Fort Missoula, Mont.

MAY 4, 1882.—Referred to the Committee on Military Affairs and ordered to be printed.

WAR DEPARTMENT,
Washington City, May 3, 1882.

The Secretary of War has the honor to transmit to the United States Senate, in connection with papers upon the same subject transmitted to that body under date of December 22, 1880, copies of official correspondence of recent dates, submitted to the department by the military authorities, relative to the necessary enlargement of the military reservation of Fort Missoula, Mont.

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT *pro tem:*
United States Senate.

FORT MISSOULA, MONT.,
March 7, 1882.

SIR: In compliance with official copy of printed letter of 8th ultimo, from chief quartermaster of the department, referred to me under date of the 9th ultimo, I have the honor to report that there is no good hay land nor coal deposit in proximity to this post but what has been taken up or entered by private parties.

The present timber reservation, containing 1,577.41 acres, and declared by the President under date of June 10, 1878, is sufficient to supply this post with the necessary fuel and lumber.

Should unscrupulous speculators attempt to take undue advantage of the government here in regard to hay for this post, sufficient hay, at reasonable rates, could be procured in open market in the vicinity of Stevensville, 20 miles south of here, baled with our hay press, and hauled, if necessary, with our own transportation.

In this connection I would invite the attention of the commanding general of the department again to the fact that no action has been taken as yet by Congress towards enlarging the present reservation of this post as recommended by the honorable Secretary of War under date of December 22, 1880, * * * which was based upon the letter of the commanding officer of this post, dated July 12, 1880, * * * stating that the enlargement asked for * * * is absolutely necessary to prevent intrusion, to provide pasturage, and to secure a safe rifle range.

I would therefore urgently recommend that the necessary steps be taken towards securing to military use by Congress not only the east one-half but the northwest one-quarter of section 36, and the east one-half of the northeast one-quarter of section 35,

together with the southwest one-quarter of section 25, all of township 13, range 20 west, as recommended by the honorable Secretary of War.

Very respectfully, your obedient servant,

WILLIAM H. JORDAN,
Major, Third Infantry, Commanding Post.

ASSISTANT ADJUTANT-GENERAL,
Headquarters Department of Dakota, Fort Snelling, Minn.

[Indorsement.]

HEADQUARTERS DEPARTMENT OF DAKOTA,
OFFICE CHIEF QUARTERMASTER,
Fort Snelling, Minn., April 11, 1882.

Respectfully returned to the adjutant-general of the department, recommending that these papers be forwarded to the honorable Secretary of War, with the request that this matter be again brought to the attention of Congress.

The necessity for the enlargement of the military reservation at Fort Missoula, Mont., is fully set forth herein.

WM. MYERS,
Deputy Quartermaster-General, U. S. A., Chief Quartermaster.

HEADQUARTERS DEPARTMENT OF DAKOTA,
Fort Snelling, Minn., April 17, 1882.

Respectfully forwarded to headquarters military division of the Missouri, inviting early attention to the enlargement of this reservation as heretofore recommended by the honorable Secretary of War.

ALFRED H. TERRY,
Brigadier-General, Commanding.

HEADQUARTERS MILITARY DIVISION OF THE MISSOURI,
Chicago, April 24, 1882.

Respectfully forwarded to the Adjutant-General of the Army. Approved.

P. H. SHERIDAN,
Lieutenant-General, Commanding.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 168.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING,

In response to Senate resolution of April 26, 1882, a statement prepared by the Commissioner of Internal Revenue, showing the total amount of tax collected on raw cotton, &c.

MAY 4, 1882.—Referred to the Committee on Finance and ordered to be printed.

TREASURY DEPARTMENT, *May* 3, 1882.

SIR: In reply to the resolution of the Senate passed on the 26th ultimo, I have the honor to inclose herewith a statement prepared, at my request, in the office of Internal Revenue, showing the total amount of tax collected on raw cotton, and giving the other information called for, excepting as to the amount of tax collected on cotton raised in the several States, which, for reasons stated by the Commissioner of Internal Revenue in his letter of the 1st instant (herewith inclosed), cannot be done so as to show the amount collected on the precise amount of cotton raised in *each* State.

Very respectfully,

CHAS. J. FOLGER,
Secretary.

Hon. DAVID DAVIS,
President pro tem., United States Senate.

TREASURY DEPARTMENT, OFFICE OF INTERNAL REVENUE,
Washington, May 1, 1882.

SIR: I have the honor to acknowledge the receipt from you of a copy of Senate resolution passed April 26, 1882, "that the Secretary of the Treasury be instructed to furnish to the Senate a statement showing the total amount of the tax collected from unmanufactured or raw cotton since the year 1861, the amount collected in each year, and the amount collected from the cotton raised in each of the several States," upon which copy of resolution is an indorsement referring the same to the Commissioner for report.

Pursuant to this request, I inclose herewith a statement giving the information required by the resolution, excepting as to the requirement of the amount of tax collected from cotton *raised* in the several States.

The tax was collected on raw cotton held or owned by the producer or purchaser, in many instances in places far remote from the place of production.

This office is now unable to tell where the cotton was grown on which tax to the amount of $867,943 was collected in the State of New York, or on which taxes were collected in any other State in which cotton is not produced. Nor is it certain that all of the cotton on which tax was collected in Alabama, or any other cotton-growing State, was produced in that State.

If the tax had not already been paid, it was levied on the cotton wherever found, and under regulations of this office it could be shipped in bond from one point to another before the payment of the tax.

The total amount of tax collected and returned to this office on raw cotton as such, from the time the tax was first imposed until it was repealed, was $68,072,388.99. The accompanying statement shows in what States and Territories this amount was collected and what proportion thereof was collected in each State and Territory, and also what part of it was collected in each of the six fiscal years during which the tax was in force.

The copy of resolution is herewith returned.

Respectfully,

H. C. ROGERS,
Acting Commissioner.

Hon. CHARLES J. FOLGER,
Secretary of the Treasury.

Statement showing the total amount of tax returned as collected each fiscal year on raw cotton, as such, under the internal-revenue laws from the several States and Territories, from the time the tax was first imposed, under act of July 1, 1862, until it was repealed by act of February 3, 1868.

States and Territories.	Fiscal years ended June 30—						Total.
	1863.	1864.	1865.	1866.	1867.	1868.	
Alabama				$3,733,620 25	$3,049,868 01	$3,604,583 84	$10,388,072 10
Arizona							
Arkansas				203,073 84	1,641,342 22	711,222 37	2,555,638 43
California				145 96	284 08		430 04
Colorado							
Connecticut	$17 72	$110 25			65 67		193 64
Dakota							
Delaware							
District of Columbia							
Florida				97,488 24	499,645 07	321,811 67	918,944 98
Georgia				3,554,544 38	3,283,276 36	5,059,274 24	11,897,094 98
Idaho							
Illinois	53,381 71	37,515 69	$65,802 79	113,732 66	76,013 72	34,697 85	379,144 42
Indiana	8,999 90	1,041 60	703 30	52,428 40	14,202 83	15,351 19	92,727 22
Iowa		*27					27
Kansas			151 34	102 64	32 17		286 15
Kentucky	12,779 67	83,050 15	83,658 34	121,550 89	149,905 16	102,383 24	553,327 45
Louisiana	19,920 93	436,044 52	593,108 02	4,300,150 17	2,971,708 19	1,777,569 17	10,098,501 00
Maine							
Maryland	1,867 66	139 91	1,168 65	4,324 03	4,424 48	39,424 79	51,349 52
Massachusetts	4,412 79	6,419 24	127 00	28,175 46	16,576 85	10,967 96	66,679 30
Michigan							
Minnesota							
Mississippi				756,629 27	4,464,664 40	3,521,702 26	8,742,995 93
Missouri	69,493 12	39,009 76	73,603 00	247,289 14	96,721 63	65,981 71	592,098 36
Montana							
Nebraska							
Nevada							
New Hampshire							
New Jersey		500 00			3,156 42		3,656 42
New Mexico							
New York	102,041 83	24,836 56	10,334 04	492,557 07	112,570 54	125,602 64	867,942 68
North Carolina				211,658 57	860,704 55	887,341 75	1,959,704 87
Ohio	70,896 24	94,086 59	39,918 92	41,691 89	85,343 00	115,190 48	447,127 12
Oregon							
Pennsylvania	5,060 89	57,895 38		6,080 62	146 03	9,352 14	78,535 06

Statement showing the total amount of tax returned as collected each fiscal year on raw cotton, &c.—Continued.

States and Territories.	Fiscal years ended June 30—						Total.
	1863.	1864.	1865.	1866.	1867.	1868.	
Rhode Island	$2,402,27	$0 01	$22 45				$2,424 73
South Carolina				$731,939 67	$1,429,281 10	$2,011,199 39	4,172,420 16
Tennessee		488,325 80	877,901 09	2,148,437 98	1,929,301 72	2,429,494 12	7,873,460 71
Texas				1,395,524 17	2,780,307 31	1,326,569 76	5,502,401 24
Utah	36 75	11 00	48 90	241 31	389 64	647 74	1,375 34
Vermont							
Virginia		1,425 83	26,435 64	168,268 29	299,147 65	330,579 46	825,856 87
Washington							
West Virginia							
Wisconsin							
Wyoming							
Total	351,311 48	1,268,412 56	1,772,983 48	18,409,654 90	23,769,078 80	22,500,947 77	68,072,388 99

*So returned by the collector; probably an error.

O

47TH CONGRESS, 1st Session. } SENATE. { Ex. Doc. No. 169.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A communication from the Chief of Engineers, United States Army, of May 4, 1882, and accompanying copies of reports from Capt. James Mercur, Corps of Engineers, upon examination and surveys of Meherrin, White Oak, and New rivers, North Carolina, &c.

MAY 8, 1882.—Referred to the Committee on Commerce and ordered to be printed.

WAR DEPARTMENT,
Washington City, May 5, 1882.

The Secretary of War has the honor to transmit to the United States Senate, for the information of the Committee on Commerce, a communication from the Chief of Engineers, United States Army, of yesterday's date, and accompanying copies of reports from Capt. James Mercur, Corps of Engineers, upon examinations and surveys made in compliance with requirements in the river and harbor act of March 3, 1881, of Meherrin, White Oak, and New rivers, North Carolina, and also of the water connection between the Waccamaw and Cape Fear rivers, with the view of ascertaining if a continuous water connection cannot thereby be established.

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT *pro tempore*
of the United States Senate.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., May 4, 1882.

SIR: I have the honor to submit herewith copies of reports to this office from Capt. James Mercur, Corps of Engineers, of the results of examinations and surveys made under his direction, to comply with requirements of the river and harbor act of March 3, 1881, of Meherrin, White Oak, and New rivers, North Carolina, and also of the water connection between the Waccamaw and Cape Fear rivers, with the view of ascertaining if a continuous water connection cannot thereby be established.

Very respectfully, your obedient servant,

H. G. WRIGHT,
Chief of Engineers, Brig. and Bvt. Maj. Gen.

Hon. ROBERT T. LINCOLN,
Secretary of War.

EXAMINATION OF MEHERRIN RIVER, NORTH CAROLINA.

UNITED STATES ENGINEER OFFICE,
Norfolk, Va., January 16, 1882.

GENERAL: I have the honor to submit the following report upon an examination of the Meherrin River, with which I was charged by orders from the Chief of Engineers, under the river and harbor act approved March 3, 1881.

The examination was made under directions from this office during the months of November and December, 1881, by Mr. Charles M. Yeates, assistant engineer, whose report, with three sheets of tracings, are forwarded herewith. The detailed map will be forwarded when completed.

The Meherrin River rises in Lunenburg County, Virginia, flows between Lunenburg and Mecklenburg through Brunswick and between Greenville and Southampton counties, Virginia. Passing into North Carolina, it runs through Northampton and Hertford counties and empties into the Chowan about 4 miles above Winton.

Skinner's Bridge, the upper limit of the examination, is a closed bridge. From thence to Princeton Landing, 4 miles, the river is only used for lumber, and is so blocked by booms that any attempted improvement would interfere with this business, or else be very temporary in its effects. From Princeton Landing to Murfreesborough, $5\frac{1}{3}$ miles, the removal of logs and fallen trees and clearing banks would cost about $4,000, and would give a channel of 8 feet at low-water. There is at present very little navigation over this part of the river, and no prospect of an immediate increase if the improvement is made.

Murfreesborough, distant from the Chowan $11\frac{1}{2}$ miles, a town of 650 inhabitants, ships annually 6,000 bales cotton, 5,500,000 feet sawed lumber, 300,000 logs, and 3,000 long piles, and receives 1,000 tons of fertilizers and general merchandise to the value of $225,000.

Vessels drawing 7 feet now reach Murfreesborough with difficulty at low-water, and the navigation is endangered by sunken logs. The removal of these obstructions would cost about $8,000, and the dredging necessary to secure a 9-foot channel, 80 feet wide, about $4,500; giving the total cost for an improvement below Murfreesborough similar to that in the Blackwater and Nottoway, of $12,500, or for the whole river, of $16,500.

This improvement would allow the line of steamers now running between Murfreesborough and the Seaboard and Roanoke Railroad at Franklin, on the Blackwater, to navigate the Meherrin drawing as much water as they now do on the Blackwater, and would allow vessels to load to as great a depth at Murfreesborough as can be carried to sea through the inlets.

The Meherrin River is in the second collection district of North Carolina.

RECAPITULATION.

Cost of improvement above Murfreesborough	$4,000
Cost of improvement below Murfreesborough	12,500
Cost of improvement, total	16,500

Very respectfully, your obedient servant,

JAS. MERCUR,
Captain of Engineers.

The CHIEF OF ENGINEERS, U. S. A.

REPORT OF MR. CHARLES M. YEATES, ASSISTANT ENGINEER.

UNITED STATES ENGINEER OFFICE,
Norfolk, Va., January 10, 1882.

CAPTAIN: I have the honor of submitting this my report on the examination or survey of Meherrin River, North Carolina, accompanied with three sheets of tracings from the original maps (scale $\frac{1}{3600}$) showing the general topographical features along the river and the depth of water therein. Overhanging trees and fallen logs are not shown on these tracings, except those between Murfreesborough and the mouth of the river, and which, from their prominence, were taken for points of triangulation.

* * * * * * * * *

The survey between Murfreesborough and the mouth of the river shows a generally good channel, whose greatest depth is 39 feet; but to get a channel of 80 feet width and 9 feet depth, for which I have estimated, it is necessary to make excavations at four points which are duly illustrated on the tracings. The river was found to contain many logs and fallen trees that hang over and in the channel, thus preventing its use, and many growing trees with branches extending over the channel, so that when the channel sets in close to the shore, as it does in many instances, navigation is deprived of its use.

Below is given an estimate of cost:

Location.	Material.	Quantity.	Rate.	Cost.
	Mud and sand.		*cent.*	
Near Wilson's Old Fishery	(Dredging, cub. yds.)	1,666.6	$0 25	$416 60
In first bend below Maddrey's Fishery	....do	444.4	25	111 10
Figger's Shoal	....do	12,088.8	25	3,022 20
In bend at Sear's barn	....do	2,000.0	25	500 00
Between Murfreesborough and mouth of river	Logs and fallen trees	1,114	5 00	5,570 00
Do	Overhanging trees	410	3 00	1,230 00
				10,849 90
Add 15 per cent. for engineering and contingencies				1,627 48
Total				12,477 38

This amount of $12,477.38 is thought to be sufficient to give the Meherrin River an ample channel from its mouth to Murfreesborough.

When the survey was completed to the mouth of the river, * * * I undertook the examination from Murfreesborough as far up the river as the appropriation would allow. That took me to Skinner's Bridge.

In many places between Murfreesborough and Princeton Landing the water is very deep, but were the fallen trees and logs removed there would be an available channelof 8 feet depth; and this would be sufficient for all purposes that would justify navigation above Murfreesborough. Therefore I have not estimated for a dredged channel above that point.

Estimates for improvement are given thus:

Location.	Material.	Quantity.	Rate.	Cost.
Between Murfreesborough and Princeton Landing	Logs and fallen trees	525	$5 00	$2,625
Do	Overhanging trees	225	3 00	675
				3,300
Add 15 per cent. for engineering and contingencies				495
Total				3,795

Thus the total amount estimated for the improvement of the river, so that from Princeton Landing to Murfreesborough there will be an 8-foot channel, and from Murfreesborough to the Chowan River a 9-foot channel, is $16,272.38. About three-fourths of a mile above Princeton Landing a depth of water of only 6 feet is attained, and before Skinner's Bridge is reached the depth is in some places only 4 feet. The river becomes quite narrow, and sunken logs and overhanging trees are in great abundance. From investigations made it is concluded that the improvement of this portion of the river would accrue little interest to others than those parties engaged in the lumber business, and from their very nature of their business, or as it is conducted now, the improvement would be of short duration, and but little time would be required for the channel to be again obstructed by logs and spiles.

The Meherrin River has its source in Lunenburg County, Virginia, and then runs down as the boundary line between Lunenburg and Mecklenburg, thence through Brunswick County, then the boundary line between Greenville and Southampton counties; thence into North Carolina, where it runs through parts of Northampton and Hertford counties and into the Chowan River, about 4 miles above Winton, the county-seat of Hertford. Its principal tributaries in North Carolina are Potecasi and Darby's creeks. The former contributes its waters about half a mile from the mouth of the river, and is wealthy in the vast amount of timber lands through which it runs its long and winding course. The water in this creek is quite deep, and its navigation seems to be impeded or hindered only by the numerous logs that extend out from the shores or cover its bottom.

Darby's Creek, commonly known as Vaughan's Mill Creek, flows into the Meherrin between Murfreesborough and Princeton, and has located upon it seven grist-mills. It is very narrow at its mouth, and is not navigable.

Murfreesborough is the only town on the Meherrin River in North Carolina, and has been commonly called the head of navigation, though steamboats and sailing vessels have frequently been up to Princeton Landing and occasionally 2 or 3 miles beyond. Murfreesborough is a very old town and was generously endowed by nature, but the enterprise of its people has not kept strides with general progression elsewhere. Its population is about 650, having considerably decreased within the last twenty years, but an idea of its business, however, cannot be well derived from its population, since it is a distributing point for a large and prosperous section of country in Hertford and Northampton counties. It contains twenty stores and two flourishing female colleges, and the last four years have brought to its business men more prosperity than was known just previously; and whereas six years ago the annual shipment of 2,000 bales of cotton was regarded with much consideration, the town now ships 6,000 bales. For many years occasional rumors of a railroad to connect the town with the outer world have been heard, but thus far it has all ended in rumor. However, it has two steamboat lines, one a weekly freight line to Norfolk, the other a tri-weekly freight and passenger line connecting with the Seaboard and Roanoke Railroad at Franklin, Va. The annual commerce of the Meherrin River is given thus: Exports: 6,000 bales cotton; 5,500,000 feet sawed lumber; 3,000,000 feet logs; 3,000 long spiles. Imports: Value of general merchandise, $225,000; 1,000 tons fertilizers.

The improvement of the Meherrin River as indicated in the report would be of great benefit to that section of country, and the amount of the estimates could be expended to advantage.

Meherrin River is in the second collection district of North Carolina.

I am, captain, very respectfully yours,

CHAS. M. YATES,
Assistant Engineer.

Capt. JAMES MERCUR,
Corps of Engineers, U. S. A.

EXAMINATION OF WHITE OAK RIVER, NORTH CAROLINA.

UNITED STATES ENGINEER OFFICE,
Norfolk, Va., April 19, 1882.

GENERAL: I have the honor to submit the following report upon the examination of the White Oak River, North Carolina, with which I was charged by your letter of March 21, 1881, and by Special Order No. 120, pargraph 13, A. G. O., May 26, 1881.

The examination was made by Mr. J. P. Darling, assistant engineer, whose report, together with a tracing of the part of the river included in the examination, is transmitted herewith.

The White Oak River, whose extreme length is probably between 30 and 40 miles, enters the Atlantic at Bogue Inlet, the southwestern end of Bogue Sound, about 35 miles west of Cape Lookout, and about 25 miles from Fort Macon, Beaufort, N. C.

One of the proposed routes of inland water communication crosses the river diagonally near Swansborough, on a line giving nearly the required depth of 9 feet at low-water, for a distance of about 2 miles. Should this line be adopted, the necessary improvement of this part of the river would be included in the general work of opening the route.

The navigation of the river is now only suitable for open sailboats drawing not more than 3 feet of water, which find their way to a market for the country produce at Beaufort and Morehead City, through Bogue Sound, which only admits of a draught of water of about 2 feet. These boats, which are in general owned by the parties whose produce they carry, afford transportation at cheap rates to all the merchandise carried up and down the river.

Any increase in depth in the river would be of no benefit to them, owing to the shoal water which, with a depth of about 2 feet, extends through a distance of 3 miles on Bogue Sound; I have, therefore, not considered it necessary to submit any project for the improvement of the river.

This river is in the collection district of Beaufort. No statistics as to the amount of commerce could be obtained. Nearest port of entry, Beaufort, N. C.; light-house, Cape Lookout; nearest fort, Fort Macon.

I remain, very respectfully, your obedient servant,

JAS. MERCUR,
Captain of Engineers.

The CHIEF OF ENGINEERS, U. S. A.

REPORT OF MR. JOHN P. DARLING, ASSISTANT ENGINEER.

UNITED STATES ENGINEER OFFICE,
Norfolk, Va., April 18, 1882.

CAPTAIN: I have the honor to submit the following report with the accompanying tracing of my examination of the White Oak River, North Carolina, made in accordance with your instructions in the month of December, 1881.

The examination extended to Stella Bridge and post-office, 10.45 miles from the inlet; from this point to the head of navigation, a distance of about 10 miles, there is said to be plenty of water, at least 5 feet.

There is only one town of any importance on the river, Swansborough, which has, I presume, about 500 inhabitants. Stella has a store, post-office, and one or two houses.

The average rise and fall of the tide in the White Oak at Swansborough during the time the gauge was kept there (six days) was 1.3 feet; the difference between the highest and the lowest tide during the same time was 1.8 feet. The east corner of the door-sill of the eastern door of the only brick store at Swansborough is 20.898 feet above average low-water.

There is 5 feet of water on Bogue Inlet Bar, and the same can be carried to Swansborough, 3,200 feet above the bar. From Swansborough up the river for about 3½ miles the water is still about 5 feet, but above that point there is only about 3 feet to the mouth of the Narrows; from the mouth of the Narrows up there is better water. In two places the channel is narrow with oyster rocks on each side; one place is just below Swansborough and the other is above Jones's Island, about 4 miles from the bar; by putting stakes on these rocks they can be avoided by vessels coming in there. There are two entrances from Bogue Sound into the White Oak, one below Weck's Island, the other above, through which nearly all the vessels go to Beaufort, N. C.; they do not care to go outside, and as they can only carry 2 feet of water through the sound, I do not see that it would do much good to expend money on the White Oak unless Bogue Sound was improved; therefore, I have made no estimate for improvement.

There are only a few small vessels that trade from this river at present, and they only draw only about 2 feet of water. I could get no information as to the amount of shipping, as each man ships his own produce; the principal articles are naval stores, cotton, lumber, and fish.

I think there would be considerable increase in shipping if Bogue Sound was improved; the distance from Swansborough to Beaufort Harbor is estimated at 25 miles.

The White Oak River forms the boundary between Onslow, Jones, and Cartaret counties, Onslow being on the west side and the others on the east.

I am, captain, very respectfully, your obedient servant,

JNO. P. DARLING,
Assistant Engineer.

Capt. JAMES MERCUR,
Corps of Engineers, U. S. A.

EXAMINATION OF NEW RIVER, NORTH CAROLINA.

UNITED STATES ENGINEER OFFICE,
Norfolk, Va., April 26, 1882.

GENERAL: I have the honor to submit the following report upon the examination of New River, North Carolina, with which I was charged by your letter of the 21st of March, 1881, and Special Order 120, paragraph 13, A. G. O., dated May 26, 1881.

The field work of the examination was carried on by Mr. J. P. Darling, assistant engineer, whose report, together with two sheets of tracings, is forwarded herewith.

New River, which lies in Onslow County, North Carolina, is navigable for vessels drawing not more than 5 feet of water from its mouth at New River Inlet where it enters the Atlantic to 3 miles above Jacksonville or Onslow, the county seat of Onslow County, and also a short distance up the northeast and southwest branches of the river.

The bar at New River Inlet barely admits vessels drawing 5 feet, and as it is composed of shifting sand, the channel is affected by storms both in depth and position.

Any works for the improvement of the bar to be effective would be very extended and costly, and manifestly not justified at this time.

The depth of water in the river is therefore sufficient, and the improvement of the river, if any is undertaken, should consist in widening and straightening the channel.

The only part of the river where this widening and straightening is needed is that indicated on the tracings sent herewith. Mr. Darling has estimated that to secure a channel 150 feet wide and 5 feet deep through the 7,000 feet where the improvement is needed will require the removal of about 80,000 cubic yards of sand and oyster shells, which at 25 cents per cubic yard and 15 per cent. contingencies amounts to $23,000.

Owing to the total absence of facilities for dredging at this point, the difficulty of obtaining fuel and water, and the great risk attendant upon taking dredges, scows, and tugs through the inlet, it is probable that the price of dredging would be much higher than this estimate, possibly costing from 40 cents to 50 cents per yard, and increasing price of the work to say $40,000.

The approximate annual shipments from this river are—

Naval stores, 20,000 barrels; cotton, 1,500 bales; together with peanuts, oysters and fish, no estimate of the quantity of which could be obtained.

New River is in the collection district of Beaufort, N. C. Nearest light-house, Cape Lookout; nearest fort, Fort Macon.

I remain very respectfully, your obedient servant,

JAS. MERCUR,
Captain of Engineers.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

REPORT OF MR. JOHN P. DARLING, ASSISTANT ENGINEER.

UNITED STATES ENGINEER OFFICE,
Norfolk, Va., April 21, 1882.

CAPTAIN: I have the honor to submit the following report of my examination of New River, North Carolina, made in compliance with your instructions in January, 1882, with accompanying tracing, two sheets.

After completing the examination of White Oak River, North Carolina, I went to the New River and commenced the examination of said river on the 5th of January, and completed it on the 17th.

New River is in Onslow County; its general course is southerly, emptying into the Atlantic Ocean through New River Inlet. It is a tide-water river for about 6 miles; the upper portion is affected by extremely high-water, but there is very little current. Up to the Narrows the river is very wide, ranging from 2,000 feet to some 3 miles, sometimes bulging out in shallow bays, with a good channel about midway. Just above the inlet, large marshes and numerous oyster rocks obstruct the water, forming narrow and shallow channels. The shores are low, mostly fringed with timber, and cultivated back from the river. The tides during the examination were very low; people living on the river said that according to their recollectien it had never been lower. At the inlet the average rise and fall of the tide was 2.5 feet; the difference between the highest and lowest tide was 2.6 feet. At Windmill Point the tide rises and falls 1.2 feet, while above the mouth of the rocks there was no perceptible change during the examination.

The bar outside the inlet is constantly changing, the sand drifting during heavy winds. At the time of the examination the channel was on the west side of the breakers in front of the inlet, but was changing to the east near the wreck of an old blockade-runner, where the channel used to be a few years ago, as I am informed. On account of very heavy seas, we were unable, in small row-boats, to take soundings about here or further seaward.

The inlet from the shore on the west to the long sand bar or beach on the east is 500 feet in width. On this sand bar a base line 895 feet in length was measured, it being the only convenient place I could find; from this base a system of triangulation, including therein the marshes and some of the rocks, was extended to Snead's Ferry, a distance of 5.57 miles; from this point the examination extended to Onslow, a distance of 17.65 miles from the inlet.

There is about 5 feet of water on the bar at ordinary low-tides, although the tracing does not show it, on account of the extreme low-water at the time of examination. Five feet of water can be carried from the inlet to the lower end of the oyster rocks, 2.16 miles above the inlet. From this point to the upper end of the oyster rocks, 7,000 feet, the same depth prevails in the channel, but it is only 50 feet in width, and very crooked, it having been cut so (I think by the State) to avoid the worst rocks, they being visible on both sides at low-water. The tide here on account of the narrowness, runs very strong. This is the only part of the river in need of improvement at present, taking 5 feet depth as a basis. From the upper end of the rock to Snead's Ferry, 5.57 miles above the inlet, there is a good channel, not less than 5 feet in depth and of sufficient width. Snead's Ferry has three stores and about a dozen houses. There are no wharves and as the water near shore is shallow vessels load at anchor. From Snead's Ferry to Onslow, there is a good channel with deep water, and there are no obstacles to navigation. This portion of the river being very wide gives good opportunities to sailing vessels.

Eleven thousand one hundred feet below the bridge at Onslow is the mouth of the Narrows, where the river is 1,000 feet wide and gets somewhat narrower before Onslow is reached. The bridge across the river at this place is about 680 feet in length and has a draw about 10 feet wide near the left bank.

Onslow, or Jacksonville, as it is sometimes called, the county-seat of Onslow County, is a place of about 800 to 1,000 inhabitants. A good amount of the produce from this place is carried to New Berne and Wilmington overland in carts. From the lower part of the river oysters and fish in considerable quantities are carried overland to Wilmington. The New River oysters are considered the finest in North Carolina. Small vessels go about 3 miles above Onslow, which is not far from the head of the river.

Seven schooners are running between Wilmington and New River; their average tonnage is 18 tons. The approximate annual shipments, as furnished me by the kindness of Mr. Marine, who has a store on the left bank, one mile above the rocks, are: Naval stores, 20,000 barrels; cotton, 1,500 bales. The quantities of peanuts, oysters, and fish are not noted by him.

I have made an estimate for straightening the channel through the oyster rocks, and making its width 150 feet, with 5 feet of water at low tide:

Length of cut	feet..	7,000
Increase in width	do...	100
Average amount of bank	do...	3
Amount of dredging required 80,080 cubic yards of shell and sand, at 25 cents per yard		$20,020 00
Engineering and contingencies, 15 per cent		3,003 00
Total		23,023 00

Very respectfully, your obedient servant,

JNO. P. DARLING,
Assistant Engineer.

Capt. JAMES MERCUR,
Corps of Engineers, U. S. A.

EXAMINATION OF WATER CONNECTION BETWEEN WACCAMAW AND CAPE FEAR RIVERS, NORTH CAROLINA.

UNITED STATES ENGINEER OFFICE,
Norfolk, Va., April 14, 1882.

GENERAL: I have the honor to submit the following report upon the examination of "the water connection between the Waccamaw and Cape Fear rivers, with a view of ascertaining if a continuous inland water connection cannot thereby be established," with which I was charged by letter of the Chief of Engineers of March 21, 1881, and Special Order No. 120, paragraph 13, A. G. O., May 26, 1881.

The field work of this examination was intrusted to Mr. John P. Darling, assistant engineer, whose report, together with three tracings, are forwarded herewith.

According to my instructions, Mr. Darling made a connection between the tide water of Livingston Creek and Juniper Creek, a branch of the Waccamaw; also between Little River and the Waccamaw, and ran a line of levels far enough to determine that no low level connection exists between Town Creek and Juniper Creek.

The results of the examination show that in the localities examined there exists a plateau with an average height above tide water of 50 to 60 feet, constituting what is known as Green Swamp, and indicate that this same plateau is continuous between the lines run.

This indication can only be verified by running a continuous line of levels along this plateau with branch lines running up all streams, or low lying ravines, which the main line crosses. This line would be about 40 miles long, and would be through a growth of underbrush, which would require clearing with briar-hooks for the greater part of the way.

The expense of running this line would exceed the amount appropriated for the examination. It was consequently omitted.

The character of the country between the two rivers, as developed by the examination and the courses of the little streams which take their rise in it, together with what is known of its general character, leads almost irresistibly to the conclusion that no low level line exists between the two rivers.

The route examined by Livingston Creek leaves deep water at a point in round numbers 20 miles above Wilmington, and strikes Juniper Creek after a cut of 20 miles; thence there is about 8 miles of Juniper Creek and about 40 miles of the Waccamaw to improve before reaching Conwayborough, the present head of navigation on the Waccamaw.

The Little River route, while much shorter, requires about the same depth of cutting as by Livingston Creek, and two locks. It strikes the Waccamaw at about 25 miles above the head of navigation, at Conwayborough, but to be available as an inland route would require the opening of navigation through the sounds from Smithville to Little River Inlet, a distance of about 35 miles, over a part of which distance there is now no navigation whatever.

Mr. Darling's estimates are made only for the amount required for excavating the main cuts, not including the cost of locks, dams, purchase of land, or the improvement of the connections of the cut with the navigable streams.

The estimates made by Mr. Darling, which are for excavating the prism of the canal only, and amount in round numbers to $1,500,000, $3,250,000, and $8,250,000, respectively, for the three plans mentioned, are based on a bottom width of cutting of 80 feet, with side slopes of 1

vertical to 2 horizontal, and are only given to show that the cost of a canal by either route would be excessive.

In addition to the excavation it will be noted that the Livingston Creek route would require four locks of high lift (14½ feet), founded in soil whose nature is unknown, except that it is either sandy or of clay.

The cost of those locks would be very great; the side slopes of 1 on 2 would not stand in sandy soil, and their protection would be very expensive; to flatten them in such deep cuts would greatly increase the excavation.

The improvement of Juniper Creek from the point at which the canal joins it, would probably require a slack-water navigation by locks and dams, and the Upper Waccamaw would require similar means, or a great deal of dredging and diking. The method of improvement could only be determined by careful survey.

The same remarks apply to the Little River route as far as side slopes and the improvement of the Upper Waccamaw are concerned. The cost of opening a route through the sounds along the coast can not be determined even approximately, as the character of the excavation is not known, except that it is partly sand and partly oyster rock, with probable admixture of mud and clay, and owing to lack of surveys, the quantity of excavation required is not known.

The cost of locks and dams and the amounts paid for land occupied by canal and flooded by back water from the dams would also have to be added to the estimates.

The cost of making a water connection between the two rivers by either of these routes would be so great as to be virtually prohibitive. I have therefore not attempted to make detailed estimates upon any of them.

I remain, very respectfully, your obedient servant,

JAS. MERCUR,
Captain of Engineers.

The CHIEF OF ENGINEERS, U. S. A.

REPORT OF MR. JOHN P. DARLING, ASSISTANT ENGINEER.

UNITED STATES ENGINEER OFFICE,
Norfolk, Va., April 12, 1882.

CAPTAIN: I have the honor to submit herewith my report with accompanying tracings, three in number, for "continuous water connection between Cape Fear and Waccamaw rivers, North Carolina," which I made in accordance with your instructions after completing the examinations of White Oak and New rivers, North Carolina. I commenced the examination on January 23, and completed it on March 4, 1882.

From the best information I could obtain, I concluded that a line from Livingston Creek, which empties into Cape Fear River, to Juniper Creek, emptying into the Waccamaw, would strike the lowest place on the divide, through the Green Swamp. I therefore commenced work at Bannum Landing, the head of tide water in Livingston Creek, 6 miles above its mouth and 32 miles above Wilmington, by water. The creek at this point is about 60 feet wide and 15 to 20 feet deep; small barges and flats carry turpentine from this landing to Wilmington; the swamps on the creek are narrow and the banks are very high, as the accompanying profiles show. From this point I ran a transit and level line up the east side of Livingston Creek, crossing the Wilmington, Columbia and Augusta Railroad about three-fourths of a mile from Bannum's, and one-fourth of a mile west of Brinkley Station; at station 22 the line enters the creek swamp and leaves it at station 55. At station 29, about 1¼ miles from the starting point, I ran a branch line to the creek at Grice's Ford, where the water was found to be 8 feet above high tide or reference point, then continued the main line from station 29 to station 55, where another branch line was run to the creek through Mr. Man-

ning's place; the water at this point was found to be 9½ feet above tide, 3 feet deep, and the creek 25 feet wide.

The main line crosses and leaves the creek at station 78, about 5.9 miles from Bannum's; the water is 25 feet above tide, 2 feet deep, and 25 feet wide. The elevation of the land on the main line to this point, except in the swamp, is from 42 to 49 feet above tide. After leaving Livingston Creek, at station 78, the land gradually rises to an elevation of 52 feet, at station 89.

Crossing Boggy, a small branch of Livingston Creek running in a southwesterly direction, at station 91, with an elevation of 47.9 feet, the land still rises until station 99 is reached, the outer edge of Green Swamp, where the elevation is 55.2. From this point to station 150, instead of low, wet land, as is generally expected in a swamp, is is high, dry, and nearly level, from 55 to 56 feet elevation. The only reason I could see for calling it a swamp is that it is covered with a dense growth of underbrush, and is said to be covered with water in very wet seasons. The first water found after entering Green Swamp was at Big Swamp Creek, at station 158. The water in this creek is 46 feet above tide and empties into Juniper Creek. At station 161, or 14.9 miles, Honey Island is reached. This island is said to be 5 miles long, east and west, by 4 miles north and south; the line runs along the west side of this island to Juniper, crossing several small creeks and swamps, emptying into Big Swamp, which runs nearly parallel with the line and about one-half mile distant on the west side. The highest point on the island is at station 173, where the elevation is 59 feet. At station 200 the line enters a cypress swamp.

Juniper Creek is reached at station 208, a total distance of 19.11 miles. At this point the creek is 175 feet wide, and 15 feet deep in the middle; this is one of a series of ponds, or lakes, which form the creek, the connecting streams sometimes drying up in the summer. The elevation of the water in this pond is 31.9 feet above the reference, or the head of tide in Livingston Creek. Station 208, the end of the line, is about 8 miles from the mouth of the creek by land, and about 14 by water, and the creek's mouth is said to be 8 miles by land below Waccamaw Lake.

From a report of C. P. Bolles, civil engineer, on a private survey, I find that the water in Waccamaw Lake is 33 feet above tide in Livingston Creek. The lake is said to contain 35 square miles of water surface, which could be utilized as a feeder for a summit-level canal.

After completing the line to Juniper Creek, I started a branch line from station 161 toward the head of Town Creek, to see if there was a lower elevation to be found in that direction.

After running this line 2.73 miles, and finding the same elevation and the same character of swamp as between stations 100 and 143 of the main line, and learning that it continued about the same for a distance of 5 miles to the head of Town Creek, 8 miles from the head of tide in the same, I concluded that the same high plateau or swamp extended parallel with the two rivers. I therefore abandoned this line, as the only way to find out positively if there was a lower place in the divide would be to run a line of levels down this plateau parallel with the rivers until a low place was found, but as it would take more time and much larger appropriation than was at my disposal, I concluded to go to Little River, South Carolina, about 6 miles above Little River Inlet, and run a line from there to the Waccamaw, with the idea of connecting Little River with the Cape Fear by way of the sound.

I commenced the line about 25 feet northwest of Captain Morse's boat-house, the general course of the line being north 46° west.

I ran a transit line; took stadia distances and levels to the Waccamaw, a distance of 5.08 miles. At station 8½, distance 3,260 feet, the line crosses a small creek; elevation of water 22.6 feet above low-tide (Little River). This creek empties into Little River about one-quarter mile below Captain Morse's boat-house. Station 11 is the highest point on the line, the elevation being 52 feet. Between stations 25 and 26 the land begins gradually to decline toward the Waccamaw. The only water the line crosses which empties into that river is at station 34, with an elevation of 40 feet.

The elevation of the bank at station 47, where the line terminates on Stanley's place, is 29.11 feet, and the low-water mark in the Waccamaw River is 11.835 above low-tide in Little River. The Waccamaw, where the line terminates, is about 100 feet wide and 10 feet deep.

There is said to be 5 feet of water on Little River bar at low-tide.

It is impossible to make a detailed estimate for either of these routes without an accurate survey being made. The following are approximate estimates for both summit-level and tide-water cuts, 80 feet on the bottom, with a slope of 2 to 1.

The estimate for the Livingston Creek line is made from Bannum's Landing up the creek to the mouth of Dan Creek; thence across to station 158 at Big Swamp; thence down Big Swamp to Juniper Creek. A summit-level canal would require a feeder from Waccamaw Lake.

Summit level 29 feet above tide:

	Cubic yards.	
Main cut sand excavation	10,419,892	
Feeder sand excavation	1,368,888	
Total, at 25 cents per yard	11,788,780	=$2,947,195
Engineering and contingencies, 10 per cent		294,719
Total		3,241,914

This summit-level canal would require two locks of 14½ lift each.

Livingston Creek tide-water cut:

Excavating 29,848,078 cubic yards of sand, at 25 cents per cubic yard	$7,462,019
Engineering and contingencies, 10 per cent	746,201
Total	8,208,220

The estimates for the Little River line commence at the mouth of the creek which empties into Little River one-fourth of a mile below the line, and go up that creek to where the line crosses it at station 8½; thence on a straight line to Waccamaw River at Stanley's, station 47.

Summit level 14 feet above low-tide in Little River, using Waccamaw River as a feeder:

Excavating 5,118,552 cubic yards, at 25 cents per cubic yard	$1,279,638
Engineering and contingencies, 10 per cent	127,963
Total	1,407,601

This summit-level canal would require one lock at Little River of 14 feet lift, and two dams at the Waccamaw River.

A tide-water cut would require the excavation of 8,562,986 cubic yards of sand, at 25 cents per cubic yard	$2,140,746
Engineering and contingencies, 10 per cent	214,074
Total	2,354,820

I have made no estimate for either locks or dams, as I have not got information enough as to the character of the river or soil.

I am, captain, very respectfully, your obedient servant,

JNO. P. DARLING,
Assistant Engineer.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 170.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

A communication from the Secretary of the Interior, inclosing a letter from the Commissioner of the General Land Office submitting an estimate of $3,200 for completing an exhibit of all the private land claims in the State of Louisiana.

MAY 9, 1882.—Read and referred to the Committee on Appropriations and ordered to be printed.

To the Senate and House of Representatives:

I transmit herewith, for the consideration of Congress, a communication from the Secretary of the Interior, inclosing a letter from the Commissioner of the General Land Office submitting an estimate for a special appropriation of $3,200 for completing an exhibit of all the private land claims in the State of Louisiana.

CHESTER A. ARTHUR.

EXECUTIVE MANSION, *May* 9, 1882.

DEPARTMENT OF THE INTERIOR,
Washington, May 6, 1882.

SIR: I have the honor to submit herewith copies of a letter from the Commissioner of the General Land Office, inclosing an estimate for a special appropriation of $3,200 for completing an exhibit of all the private land claims in the State of Louisiana, and beg leave to suggest that the same be transmitted to Congress for its consideration.

Very respectfully,

H. M. TELLER,
Secretary.

The PRESIDENT.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., May 4, 1882.

SIR: I have the honor to submit herewith inclosed, in duplicate, a special estimate of appropriation of $3,200, required for the surveying service in Louisiana, with request that, if approved by the department, the same may be forwarded to the President, that he may transmit the estimate to Congress for action thereon.

A brief explanation of the estimate appears on the face of it; but in further explanation of the same and of the need thereof, I have the honor to state that there is on file in this office an exhibit of all private land claims in Missouri, prepared many years ago in Saint Louis, such as is now desired from Louisiana. This Missouri exhibit is of incalculable benefit to the General Land Office.

Before the war of the rebellion, Surveyor-General W. J. McCulloh commenced such an exhibit of all claims in Louisiana; it was, I am informed, about half completed—gotten up with great care—and, if completed, would be a document which would be the means of saving money to the government in its every-day use here; saving not only in *time*, but assisting in arriving at correct conclusions, and avoiding errors in examining the unadjudicated claims in said State. That exhibit, so far as tabulated, is now in a good state of preservation at New Orleans.

It is estimated that there are in Louisiana over *ten thousand confirmed* private land claims and donations, large and small, all of which are supposed to be exhibited in the American State Papers; and, generally, the original reports thereon by boards of commissioners or registers and receivers are here on file.

These *reports*, however, do not show the *locus* of said claims, except by *parishes* and *water-courses*, which is very indefinite; and, in very many cases, especially in donations to actual settlers who possessed no title of any kind under a former government, there is no description of the land donated. This office should possess an exhibit, prepared with care under the supervision of the surveyor-general, with the aid of the field-notes and other memoranda in his office, showing the condition of the claims, *so far as can be ascertained;* especially whether they have ever been located *pro tanto*, or *satisfied* by the United States, or *absorbed* by other private claims or surveys of lands as public lands.

The surveyor-general has estimated that there are in said State confirmed claims which have never been located or satisfied, but are simply lying *dormant*, amounting to between 1,100 and 1,200, with an average area of 500 acres.

There is a mass of information in the surveyor-general's office, and unknown to this office, which should be consolidated in such an exhibit.

If I should attempt to arrive at the present condition of all these confirmed but unsatisfied claims, it would be necessary—

1st. To prepare a list of all confirmed claims and donations in Louisiana, by comparison of the original reports and the statutes.

2d. To examine every Louisiana plat of survey on file here (amounting to about 2,000 township plats, independent of individual surveys), and check on such list the claims which have been surveyed, then check the *unlocated* claims which have been satisfied by the issue of *scrip*, and those cases also which have been *rejected* by decisions of this office or the department.

In this way only could we identify the particular claims still liable to satisfaction by the government under existing laws.

But such an exhibit would be more particularly valuable (and is actually *necessary*) for daily reference in answering verbal inquiries respecting Louisiana claims and replying at short notice to letters, both special and otherwise.

As before stated, there are also many facts recorded in the surveyor-general's office respecting said claims which do not appear on the records of this office, and can only be brought out by lengthy correspondence with the proper officers at New Orleans. This would be partly remedied by the proposed exhibit.

I think there is every reason why this document, commenced and half completed, with great care (it is said), should now be perfected by the surveyor-general.

Very respectfully, your obedient servant,

N. C. McFARLAND,
Commissioner.

Hon. H. M. Teller,
Secretary of the Interior.

Estimate of special appropriation required for the surveying service in Louisiana.

For completing an exhibit of all the private land claims in the State of Louisiana $3,200

Explanation.—The above special estimate of $3,200 is submitted in order to enable the United States surveyor-general for Louisiana to employ such competent and necessary clerical force as will enable him to have completed the exhibit of all private land claims in that State, which exhibit has already been half compiled, and, when completed, will be very essential as a work of reference in the daily transactions of the General Land Office in adjudicating the private land claims in Louisiana.

N. C. McFARLAND,
Commissioner.

Department of the Interior, General Land Office,
May 4, 1882.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 171.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

A communication from the Secretary of the Interior, inclosing a letter from the Superintendent of Census, submitting an estimate for an appropriation of $80,000 to defray the expenses of the Census Office during the remainder of the present year.

MAY 9, 1882.—Read and referred to the Committee on Appropriations and ordered to be printed.

To the Senate and House of Representatives:

I transmit herewith, for the consideration of Congress, a communication from the Secretary of the Interior, inclosing a letter from the Superintendent of Census, submitting an estimate for an appropriation of $80,000 to defray the expenses of the Census Office during the remainder of the present fiscal year.

CHESTER A. ARTHUR.

EXECUTIVE MANSION,
May 9, 1882.

DEPARTMENT OF THE INTERIOR,
Washington, May 8, 1882.

SIR: I have the honor to submit herewith a copy of a letter from the Superintendent of Census, embodying an estimate for an appropriation of $80,000 to defray the expenses of the Census Office during the remainder of the present fiscal year, being in the nature of a deficiency, and beg leave to suggest that the same be transmitted to Congress for its consideration.

Very respectfully,

H. M. TELLER,
Secretary.

The PRESIDENT.

DEPARTMENT OF THE INTERIOR, CENSUS OFFICE,
Washington, D. C., May 6, 1882.

SIR: I have the honor to present, in compliance with your verbal request of yesterday, an estimate of the sums which, in my judgment, are

necessary to defray the liabilities and expenses of this bureau during the remainder of the present fiscal year, as follows:

For expenses, &c., Washington office:

Pay roll	$45,820 80
Rent	3,500 00
Miscellaneous and contingent expenses	2,200 00
	51,520 80

For special agents and assistants:

Salaries	$29,631 63
Expenses	7,250 00
	36,881 63

Furthermore, there are the following outstanding accounts against the office, which are mostly valid and will doubtless be payable at some time, but a considerable portion of which are not likely to be properly presented and adjusted during the present fiscal year, viz:

For miscellaneous accounts:

Supervisors	$712 45
Enumerators	950 00
Railroad accounts	4,228 68
	5,891 13

The total of these estimated liabilities is $94,293.56. The total amount of appropriations available for the payment of these expenses yet unexpended is $18,245.18; balance not provided for, $76,048.38.

I would therefore recommend that Congress be requested to appropriate $80,000 for the uses of this office during the remainder of the present fiscal year.

Very respectfully, your obedient servant,

C. W. SEATON,
Superintendent of Census.

Hon. H. M. TELLER,
Secretary of the Interior.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 172.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A communication from the Chief of Engineers of May 8, 1882, and accompanying copies of reports from Maj. Amos Stickney, Corps of Engineers, upon examinations and surveys of Atchafalaya River and of Bayous Grand Caillou and Little Caillou, Louisiana.

MAY 10, 1882.—Referred to the Committee on Commerce and ordered to be printed.

WAR DEPARTMENT,
Washington City, May 9, 1882.

The Secretary of War has the honor to transmit to the United States Senate, for the information of the Committee on Commerce, a communication from the Chief of Engineers of yesterday's date, and the accompanying copies of reports from Maj. Amos Stickney, Corps of Engineers, upon examinations and surveys of Atchafalaya River and of Bayous Grand Caillou and Little Caillou, Louisiana, made in compliance with requirements in the river and harbor act of June 14, 1880.

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT *pro tempore*
of the United States Senate.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., May 8, 1882.

SIR: I have the honor to submit herewith copies of reports to this office from Maj. Amos Stickney, Corps of Engineers, of the results of examinations and surveys made, to comply with the requirements of the river and harbor act of June 14, 1880, of Atchafalaya River, and of Bayous Grand Caillou and Little Caillou, in the State of Louisiana, the execution of which had been assigned to the late Maj. C. W. Howell, Corps of Engineers, and left unfinished at the time of his death.

Very respectfully, your obedient servant,

H. G. WRIGHT,
Chief of Engineers, Brig. and Bvt. Maj. Gen.

Hon. ROBERT T. LINCOLN,
Secretary of War.

SURVEY OF ATCHAFALAYA RIVER, LOUISIANA, FROM BERWICK'S BAY TO MOUTH OF RED RIVER.

UNITED STATES ENGINEER OFFICE,
New Orleans, La., April 26, 1882.

GENERAL: I have the honor to submit the following report on the Atchafalaya River, compiled from the notes of Assistant Engineers Collins and Hoffman, who made the survey called for in river and harbor act of June 14, 1880, of "Atchafalaya River, Louisiana, from Berwick's Bay to mouth of Red River." This report, together with report of Major Howell, October 5, 1874, which will be found in the annual report of the Chief of Engineers for fiscal year ending June 30, 1874, Part I, Appendix R, 14 pages, 771 to 776, will furnish the information called for in the resolution of the Senate of the United States, of December 21, 1881, which was transmitted to me in department letter of December 28, 1881. This report has been delayed by absence in the field of one of the assistant engineers who made the survey. The project for the survey of the Atchafalaya River will be found in the following letter:

UNITED STATES ENGINEER OFFICE,
New Orleans, July 8, 1880.

GENERAL: I have the honor to submit the following project and estimate for a detailed survey and examination of Atchafalaya River (including Grand Lake), from Berwick's Bay to mouth of Red River, as provided for in section 2 of the river and harbor act approved June 14, 1880.

Grand Lake is included in this project, because it receives at its head the waters of the Atchafalaya through a number of bayous into which the river divides itself above, while from the foot of it, the old Atchafalaya, joined 3¼ miles from its head by Bayou Teche, leads into Berwick's Bay. The importance of the Atchafalaya as a high-water outlet of the Mississippi is deemed sufficient to warrant the expense of a detailed survey of it and its principal branches leading into Grand Lake, also Grand River, to connect with Bayou Plaquemine.

The route followed by commerce on Grand Lake is along its eastern shore, and on this account it is proposed to include this shore of the lake in the detailed survey. It is also proposed to make a transit and stadia reconnaissance of the western shore of Grand Lake and of the smaller branch bayous of the river. Six large navigable bayous empty into Grand Lake on its eastern shore, connecting with the Atchafalaya above, and it is considered of importance that these should be examined.

ESTIMATE.

Detailed survey, 280 miles, at $30 per mile	$8,400
Examination, 500 miles, at $10 per mile	5,000
Hydrography (Grand Lake), 100 square miles, at $4 per mile	400
	13,800
Contingencies, 20 per cent	2,760
Total	16,560

The project and estimate include the locating of all obstructions to navigation and gaining all information needed to estimate for the removal of the same, and for showing the commercial importance of the river and its bran hes. An examination simply would cost $9,840.

Very respectfully, your obedient servant,

C. W. HOWELL,
Major of Engineers.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

This project, Captain Lockwood informs me, was not strictly carried out, because Major Howell considered the first 3 miles from Red River was sufficiently covered by Major Benyaurd's surveys, and the portion

below the head of Grand Lake presented no obstacles to navigation, and was sufficiently covered by the survey of 1874.

The survey was commenced in the latter part of September, 1880, at a point 3 miles from the head of the river, and was continued down stream to Butte la Rose, which point was reached November 22. From this point the line followed was via Ouska Bay and Grand River to the Plaquemine, thence up the Plaquemine to its head. After this, the work was carried down Lower Grand River from the mouth of the Plaquemine to the junction of the Grand and Bayou Sorrel, down the former to Dr. Choppin's sugar-house, and down the latter to Lake Chicot, when (February 5), the water having reached such a stage as to seriously interfere with the work, stations for future reference were established, and the quarter-boat taken back to the head of the Plaquemine.

In September, 1881, the survey was continued by Assistant Engineer Hoffman, who ran a line down the Little Tensas, Tensas Bay, Lake Mongolois, and Bayou Chéne, to Lake Chicot; another down the Big Tensas to Lake Mongolois, then the line Little Atchafalaya and La Rompe to Lake Mongolois. Bayous Rigarby, Jake, &c., to Lake Chicot, were then surveyed; and lastly, the connection between Lake Chicot and Grand Lake.

Throughout the survey the main lines were run on true azimuth, while compass bearings were taken in running out the small bayous. Distances were measured with a stadia. Where possible, precautions were taken to insure the permanency of instrumental stations, and for this purpose live trees were cut down and their stumps used; as most of these will sprout out and continue growing, there will doubtless be no trouble in future surveys in finding a sufficient number of points to connect with the present one.

A line of levels was run, connecting Major Benyaurd's benches, 3 miles from the head of the Atchafalaya, with tide-water in Lake Chicot, via the Atchafalaya, Grand River, Little Tensas Bayou, and Bayou Chéne. The line was also extended, via Grand River and Bayou Plaquemine, to the Mississippi at the town of Plaquemine. Bench-marks were established frequently, in most cases by driving a nail in a notch in a live tree, and, as these are plotted on the chart, they can be readily found in future when necessary. The reference of water surface was determined at several points in each mile. Gauge readings were taken at the head of the Atchafalaya throughout the survey, and also, from December 1, at La Rompe, a few miles below Butte la Rose. The plane of reference for all levels reads 0.00 on the gauge at head of Atchafalaya.

SOUNDINGS.

Cross-sections were taken in the obstructed portions of the river at intervals, varying from 100 to 250 feet; where there were no obstructions the distance between cross-sections was from 1,000 to 2,000 feet. Each cast of the lead was instrumentally located.

DETAILED DESCRIPTION.

Commencing at the upper limit of the survey, which was Major Benyaurd's lower cross-section line, the river banks are 43.5 feet above low-water.

Bayou De Glaize enters the Atchafalaya at Simmsport, and the west bank, between its mouth and Lower Old River, is covered with woods;

below Simmsport the west bank is leveed, as is also the east bank, the levee on the latter side extending to Old River above.

One mile above Simmsport, on the east bank, a recent cave showed evidences of the old raft that formerly filled the river; above the old pieces of logs, &c., which showed to a height of 10 feet above the water surface at the time of survey, or 20 feet above low-water of 1879, there was a deposit 23 feet in depth of red and gray clay and surface soil. In the raft material, pieces of red cedar were found, the inner portions of which were solid, but other woods had become so changed by age and the constant and heavy pressure they had been subjected to that it was impossible to tell to what species they belonged. The pressure had been so great and so long continued that many pieces were flattened and much compressed. On this bank no blue clay was observed above Simmsport. In taking cross-sections, log bottom was found in many places, which was evidently indication of raft formation like that exposed by caving of left bank before mentioned. The river was at one time filled up with rafted material, which was cleared out to a certain extent by the State of Louisiana before the war.

The cross-sectional area of the river at Simmsport was at the time of survey 19,667 square feet, but at the height of high-water of 1874 it would be 54,550 square feet. The gauge reading at the time the cross-sectional area was determined was 10.152 feet. The high-water gauge reading of 1874 was 44.509 feet; the low-water of 1879, 0.000 feet, and of 1880, + 5.00 feet.

Simmsport is the shipping point for the country up Bayou De Glaize as far as Evergreen. Both banks of the river here are caving, and three successive leveeshave been built on both sides of the river, and in some places the fourth levee is now at the top of the bank and in danger of going in. Mr. Barbre, who settled here in 1828, and several other old inhabitants told Mr. Collins that formerly at low-water there used to be a good ford for stock at Simmsport; but now the river is 630 feet wide at low-water and about 50 feet deep, while during high-water of 1874 it was about 100 feet in depth. This is said by old inhabitants to be the same place where the ford was in 1840, and at that time a log was used by foot-passengers to walk across on, the ends of the log resting on either side of the river, which is said to have been but 40 feet in width.

On the right bank, just below Simmsport, a large cave exposes blue clay, the top of which has a reference of 29.19 feet. Above this blue clay is red soil of Red River deposit. Soundings near the channel give blue clay bottom. The right bank throughout the third mile is caving, and the left also at the lower end.

Fourth mile.—The left bank is caving all along this mile, and the right bank near the lower end of it. During the high-water of 1874, a crevasse was formed in the left bank near the lower end of this mile; the hole cut out was 35 feet deep, extreme width 350 feet; this has been closed.

Fifth mile.—The right bank is caving throughout this mile, but the left bank only at the lower end of it. Twenty-eight cross-sections were sounded in the first 5 miles, and the shoalest section shows 22 feet in channel at extreme low-water, while the least width at this stage was 500 feet. There were at the time of survey four snags in sight in the 5 miles mentioned, which projected above the water from 3 to 6 feet, the stage of water being about 10 feet.

Sixth mile.—The whole left bank and the right bank also in the lower half of the mile are caving.

Seventh mile.—The mouth of Yellow Bayou, which formerly entered the river from the west near the upper end of this mile, has been closed by a levee. The right bank of the river is caving throughout the mile, but nowhere was blue clay exposed. The depth of water in channel is nowhere less than 34 feet at extreme low-water.

Eighth mile.—The whole left bank and the upper and lower fourths of the right bank are caving. The mouth of Bayou Moreau, which formerly entered the river at about the middle of this mile, has been closed by a dam. This bayou originally discharged into the Atchafalaya only during low-water in the latter.

Ninth mile.—The right bank of the upper half and the left bank for the whole extent of this mile are caving.

Tenth mile.—Both banks throughout this mile are caving. Three bad snags were found in the 5 miles ending with the tenth. These are only dangerous when below the surface of the water, as when they are visible there is ample room to avoid them.

Eleventh mile.—The river here makes a sharp bend to east-southeast, and the right bank is caving fast. A depth of 80 feet is found in the bend at extreme low-water.

Twelfth mile.—The river here turns sharply to westward. The entire left bank and the upper right bank are caving fast. Three bayous, Marine, Middle, and Stark, which formerly entered from the east, have been closed.

Thirteenth mile.—Both banks are caving throughout this mile.

Fourteenth mile.—Near the lower end of this mile the rapid caving of the point in the sharp bend that formerly existed here has straightened the river, and the old bend is rapidly shoaling.

Fifteenth mile.—The entire left bank and nearly all the right bank in this mile are caving. On the east side no levees were visible, and the old cleared fields were partly grown up with trees and brush. The land on the west bank is still under cultivation.

In the 5 miles ending with the fifteenth eight large snags or drift trees were found. The shoalest cross-section showed 18.5 feet at extreme low-water, while in the bend on the fourteenth mile a corresponding depth of 91.5 feet was found. There are six bends of about 90° in this 5 miles.

Sixteenth mile.—The river here is nearly straight and both banks are caving.

Seventeenth mile.—Same as for sixteenth mile.

Eighteenth mile.—There is a sharp bend to the east near the head of this mile, and one to the south at its lower end. Both banks are caving, the land going in in large slides. The cross-section at lower end of the mile shows a depth of 120 feet at extreme low-water.

Nineteenth mile.—The course of the river throughout this mile is about south. Both banks are caving. On the west bank, near the lower end of the mile, is the old mouth of Bayou Current, which formerly emptied into the Atchafalaya during low-water. The head of a great block of raft was originally just below here, and during high-water the Atchafalaya discharged its waters into the west side swamps through the bayou. After the removal of the raft a high dam connecting with the levees was built across the mouth of the bayou. The land on the west side of the river is under cultivation, but the east side levees are too low to guard against high-water, and the plantations below the fifteenth mile have been abandoned. The stage of water when the survey reached this point was about 9 feet above extreme low, and the remains of the old raft formation showed above water at about the end of this mile,

while the cross-section taken just above showed log bottom on each side of the channel.

Twentieth mile.—Except for the lower 1,200 feet of this mile the old raft projected above water at time of survey, and the logs of the sunken portion were so near the surface that the boils and eddies showed their position. A narrow channel through this section is comparatively clear, but the positions of logs, &c., are constantly changing, as they are washed out and lodge lower down, so that steamboat navigation is dangerous at nearly all times. The bank is caving everywhere on both sides throughout this mile. The channel is getting better each year as the old drift logs are washed out, but the removal of the raft by a snag-boat would be a much more expeditious method, and, considering the dangers to navigation, more economical as well. The rafted material extends under the banks on both sides, showing that the limits of the old channel have not yet been reached.

Mr. A. A. Richards states that when he settled in this locality (about 1840) the river was small, and that he could cross it anywhere on the raft for many miles; that it was hardly 200 feet between the high banks, and that there were no levees, and the land was never overflowed. At the time of survey the width between high banks was 800 feet, and the greatest depth at extreme low-water 35 feet. The banks of Lake Bayou, which enters the river from the east just below Mr. Richards' house, and the banks of the river itself cover old raft, the top of which is about 20 feet above low-water surface, and is covered by 15 to 18 feet of red deposit. The twentieth mile is nearly the head of the raft, which is almost continuous to Bayou Rouge.

Twenty-first mile.—Both banks are caving throughout this mile. Raft borders one or both sides in most places, and was found at the bottom with nearly every cast of the lead. The caving has been so rapid for the past year that the new levee, which was 220 feet from the bank at Mr. Richards' house 1½ miles above, has caved in near the lower end of the mile. There is a ridge of logs near the middle of the river for most of this mile, which is said to have once projected above the water; its height is now 15 feet above the general bottom.

Twenty-second mile.—Both banks are caving throughout this mile. The old raft is found all along the left bank, running under the red deposit. The section taken at the lower end of the mile shows a low-water width of 950 feet, and depth of 85 feet. The section 450 feet above has the same width, but a depth of 110 feet. The next, 400, feet further up stream, has a width of 380 feet and a depth of 29 feet.

Twenty-third mile.—Gordon's Island is on this mile. But a few years ago, according to the statement of Mr. Gordon, this island was quite extensive and heavily timbered; it was formed by a deposit of red soil on the old raft, and its elevation was about the same as that of the banks. Since 1874 the island has decreased materially in size, and the deposit of soil has been washed away so that nothing is left but the logs composing the raft and the mud that has settled between them. The upper end of the island is now below the zero of the level line, while the lower end is only 8 feet above that point. The river banks are caving everywhere on this mile. The depth of channel on the west side of the island is only 11 feet at zero of level line. The channel to the eastward of the island is only used with a 10-foot rise, and has not been used even at that stage but for a short time; it is now cutting out fast.

The land on the west bank is all under cultivation, the levees still being kept up, but on the east bank the levee is only found on projecting

points, and the only crop raised is cotton that is planted after high-water.

The channel is improving each year as the raft is torn out by the current, and if this is increased, or even maintained as it now is, there will eventually result an unobstructed channel.

At present the convex as well as the concave sides of the bends are caving, and frequently whole points go in at one slide, shortening the channel. At the lower end of this mile and head of the

Twenty-fourth are large slides on each bank; here the depth of water is 42 feet, but just below the slides it is 108 feet at the zero of level line.

The increase in width of river due to these slides is 420 feet. Blocks of raft were found in the bed of the river by the lead in many places on this mile, while the banks are caving and sliding in more or less on both sides.

Twenty-fifth mile.—This mile reaches to Churchville. Log bottom is found everywhere throughout it. The cross-section of the river is fast increasing by caving of banks and scouring out of bottom.

Twentieth to twenty-fifth mile.—These 5 miles were one continuous block of raft when the State began the Atchafalaya improvement. For nearly all the distance the raft runs under one or both banks, and the bottom of the river is paved with logs, except where deep holes are found, showing that, great as has been the increase in the channel since Captain Bradley first cut the narrow passage through the raft, it is yet very far from being as extensive as it was before the rafting process originally began. Little cultivated land is now found on the east bank, although it was formerly leveed. On the west bank from two to five levees have been constructed, and the last one is now in danger of caving in at several places. All the land on this bank above the swamps is under cultivation, sugar and corn being the principal crops. The mouths of all bayous have been closed, so that drainage is now effected through the swamps. These bayous appear to have retained their original depths back of the dams, although their old mouths are nearly obliterated in every case. Before removal of the raft there was about equal cultivation on both banks, and no levees were needed; now there are only a few isolated places on the east bank cultivated.

Twenty-sixth mile.—Seventeen cross-sections were sounded on this mile, and in nearly all cases log bottom was found, and for about half the mile logs project above the water surface at extreme low-water.

The old mouth of Bayou Rouge is at about the middle of the mile on the west bank; it is closed by a high and wide dam connecting with the levees. In front of it are the remains of an old raft island, the logs of which show above the water surface with an 18-foot rise, for a length of about 1,000 feet, and width varying from 100 to 300 feet. Bayou Rouge is navigated by a small steamer, which transfers freight to the boats running regularly on the Atchafalaya. She supplies the plantations nearly to Evergreen. The channel by which boats pass the raft at the mouth of Bayou Rouge is one of the worst on the river, owing to the number of snags and the shoalness of the water at low-river. The bank is caving fast, and there is a strong current, even at low-water.

Twenty-seventh mile.—One of the great caves that is moving up and widening the river has reached about the middle of this mile, causing an abrupt increase in width of more than 200 feet on the right bank. The left bank opposite this cave has a block of old raft running under the bank, and all the cross-sections below it show log bottom and very shoal water along the left bank for one-third or one-half the width of the river. Both banks are caving for the entire mile.

Twenty-eighth mile.—The plantation of Dr. Hartman occupies the right bank on the twenty-eighth mile, and is the last one on which the levees have been kept up and rebuilt as they caved in.

Twenty-ninth mile.—The banks on this mile are caving rapidly. Cow Head and Muscle Bayous enter the river on the left bank, about 750 feet apart, near the middle of the mile. Between their mouths is the crossing of the New Orleans Pacific Railroad. The west side of the river at the railroad crossing is a point of land composed of hard clay, between two large caves, and projects into the river fully 200 feet beyond the general shore line above and below. The greatest depth at the crossing is 28 feet at zero of level line, and the width at low-water 600 feet. Fifteen hundred feet above this line a section shows a greatest depth of 95 feet, and 350 feet below there was found a depth of 56 feet at low-water.

Thirtieth mile.—The banks are caving fast on this mile and no effective levees remain. The old fields are covered with small trees. Four cross-sections were sounded on this mile, and the shoalest one gave a depth of 30 feet.

Thirty-first mile.—This mile includes two sharp bends, each of about 90 degrees. The upper one is called the steamboat graveyard, in consequence of three steamers having been snagged and sunk here. The projecting points on both banks are caving in fast, which has the effect of shortening the channel.

Thirty-second mile.—Both banks are caving. Five cross-sections were sounded on this mile, the shoalest of which showed over 40 feet of water.

Thirty-third mile.—Petite Prairie Bayou leaves the river on the right bank at about the middle of this mile, but at a 15-foot stage water also leaves the river for the same bayou through three washed-out channels at the upper end of the mile. This bayou previous to 1874 was choked with raft, but the high-water of that year cleared it out, and now its banks are caving fast and increasing its cross-section. It runs out into the swamps and river lakes.

Thirty-fourth mile.—This mile includes Wiltsey's Is'and, which is still covered with red soil to a height of 15 feet above the old raft, which forms the foundation of the island. This raft formation extends 2,300 feet above the high part of the island, portions of it still showing above water even with a 10-foot rise. The high part of the island is 850 feet long, with a greatest width of 75 feet; some of the trees growing on it are as large as those found in the forests on the river banks.

An abandoned plantation on the right bank, which formerly extended from the mouth of Petite Prairie Bayou to below Wiltsey's Island, was originally cultivated without levee protection; afterwards the removal of the raft necessitated the building of levees. The high-water of 1874 was 2.5 feet above the top of them, and indicated that the high-water of that year was more than 8 feet above what it was when the river was rafted. The banks are caving on both sides.

Thirty-fifth mile.—Both banks on this mile are also caving. The shoalest section showed a low-water depth of 30 feet.

Thirty-sixth and thirty-seventh miles.—Eleven sections were sounded on these two miles, the shoalest of which gave 31 feet at low-water. Both banks are caving.

Thirty-eighth mile.—Bayou Blaylock enters from the east near the head of this mile. At low stage a little drainage-water enters the river from this bayou, but at high-water it, like all the others, is a run-out

bayou. The shoalest section on this mile has a depth of 36 feet at low-water, with a least width of 400 feet.

Thirty-ninth mile.—There are many snags on this mile, although the shoalest section gave 32 feet at low stage. Log bottom was found on every section sounded, and both banks are caving.

Fortieth mile.—Both banks caving. The shoalest section of the five sounded on this mile gave a depth of 35 feet at low-water.

Forty first mile.—Large plantations were in cultivation here up to 1874, levees having been built previous to that time. After the overflow of that year they were practically abandoned. The shoalest section sounded gave 31 feet low-water depth, and a width of 420 feet. Many snags are visible above the water, and remains of raft blocks were found on each section covering quite half the width of the river.

Forty second mile.—At the head of this mile is an island 600 feet long and 65 feet wide. Its foundation is old raft, on top of which there is a deposit of 10 feet or more of red soil. Large forest trees are growing on this island. The east channel was the one cleared out by the State when the improvement of the Atchafalaya was undertaken, and the depth through it at time of survey was 30 feet. That through the west channel is only 18 feet. Navigation is still dangerous, however, owing to projecting logs and snags. Half a mile below the island is the head of Alabama Bayou. Its discharge at time of survey was 2,327 cubic feet per second, while that of the Atchafalaya, below the Alabama, was 14,413 cubic feet per second. The river at the time was 4.1 feet above extreme low. Four miles from the Atchafalaya, Bayou Alabama is closed by raft, and the water passes around this obstruction through bayous on its left bank to rejoin the Alabama about 1 mile below the raft. The river is 575 feet wide above the Alabama, and 380 feet wide below.

Forty-third mile.—On this mile seven sections were sounded, and the shoalest gave a depth of 32 feet at low-water, with a low-water width of 350 feet.

Forty-fourth mile.—Both banks caving. The width is about the same as for forty-third mile, and the shoalest section showed a depth of 33 feet.

Forty-fifth mile.—The width of the river in the large bend on this mile is 825 feet, and depth 85 feet at low-water. The shoalest section sounded gave 20 feet at same stage. The banks are caving fast, even under the points.

Forty-sixth, forty-seventh, and forty-eighth miles.—Both banks caving. The shoalest cross section gave 35 feet depth at low-water. The width is quite uniformly 300 feet throughout these 3 miles. The high-water marks of 1880 are above the surface of the land.

Forty-ninth mile.—Bayou Courtableau enters from the west at about the middle of this mile. At present, with a rise of 6 feet in the Atchafalaya during low-water in the Courtableau, the water runs up the latter and passes out to the south through Run-out Bayou. When the contemplated dams are built, closing these, the water of the Courtableau will empty into the Atchafalaya, even during a 12-foot rise.

Fiftieth mile.—This mile has a number of short bends, caused by rapid and irregular caving of banks. Six sections were sounded, the shoalest of which showed a depth of 30 feet at low-water, the width at this stage being 250 feet.

Fifty-first mile.—There are three bends of 90 degrees on this mile, and the banks on both sides are caving rapidly, even under the points of the

bends. Six sections were sounded, the shoalest of which gave a depth of 28 feet at low-water.

Fifty-second mile.—Both banks are caving fast. The shoalest section gave a depth of 26 feet at low-water. The least width was found to be 240 feet, although in some places, from extensive slides, it was 400 feet or more. At high-water the banks are everywhere covered.

Fifty-third mile.—The banks are caving on both sides. The narrowest place is 280 feet wide, and the shoalest section gave a depth of 36 feet.

Fifty-fourth mile.—Both banks caving. The shoalest section gave a depth of 40 feet.

Fifty-fifth mile.—Same as above, except that shoalest section gave a depth of 38 feet.

Fifty-sixth mile.—Both banks are caving. The Alabama returns to the river on this mile. The former was examined for 7 miles above the junction, soundings and topography being taken. It is not enlarging, and does not appear to have done so since the Atchafalaya raft was opened. Below the Alabama the Atchafalaya is wider and deeper than above; 42 feet was found on the shoalest section, with a least low-water width of 280 feet.

Fifty-seventh mile.—The shoalest section, taken at the lower end of a straight reach of 1½ miles, showed a depth of 36 feet and a width of 300 feet. Banks are everywhere below high-water mark, and no levees were found.

Fifty-eighth mile.—There are two long easy bends on this mile. Deep water was found throughout, and no place narrower than 300 feet.

Fifty-ninth and sixtieth miles.—The banks are everywhere caving. The shoalest section gave a depth of 42 feet.

Sixty-first mile.—The shoalest section gave a depth of 37 feet.

Sixty-second mile.—Shoalest section 35 feet deep. The left bank is very low for 4,000 feet. The right bank is higher, but below high-water mark.

Sixty-third and sixty-fourth miles.—An old sugar plantation occupies the left bank, but is not now in cultivation. The high-water of 1880 was a foot above the highest part of the fields, while that of 1874 was 2 feet higher than that. The shoalest cross-section gave a depth of 37 feet at low-water.

Sixty-fifth mile.—Both banks are caving. The shoalest section gave a depth of 41 feet at low-water.

Sixty sixth mile.—At the head of this mile the Atchafalaya turns with a sharp bend to the east and enters the head of Grand River at Butte la Rose. The width of the Atchafalaya at its entrance is 260 feet, and its depth 44 feet. The width of Grand River just below is 850 feet, and its depth 44 feet. The extension of Grand River beyond the Atchafalaya to the westward receives the water from the run-out bayous of the Courtableau. Butte la Rose is an ancient shell mound on the south side of Grand River. During the war Fort Burton was built on it. It is the only place in this section above high-water. Grand River is properly the continuation of the Atchafalaya, and the survey was continued down it in the direction of the Plaquemine, leaving the bayous connecting to the southward with Lake Mongolois, &c., to be examined afterwards. The Little Atchafalaya runs out of Grand River to the south, near the end of this mile. It is about 125 feet wide and very crooked. It is not used for navigation.

Sixty-seventh mile.—The width throughout this mile is about 400 feet, and the depth at low-water 45 feet. A willow batture, from 100 to 250 feet wide, and grown up with young willows, is found all along the left

bank for this and the 3 miles below, showing that the channel has contracted somewhat in late years.

Sixty-eighth and sixty-ninth miles.—Both banks are overflowed at high-water, so that the land formerly cultivated on the right bank has been abandoned. The width in the narrowest place is 380 feet at low-water, and the depth at same stage found on the shoalest section is 45 feet.

Seventieth mile.—The depth on shoalest section was found to be 54 feet at low-water, and least width at same stage 370 feet.

Seventy-first mile.—Near the head of this mile Bayou la Rompe runs out to the south. Discharge measurements were made in the Rompe, and in Grand River just below it, with the following results: La Rompe, 20,073 cubic feet per second; sectional area, 6,200 square feet. Grand River, 16,040 cubic feet per second; sectional area, 9,475 square feet; 1,900 feet below its head Bayou la Rompe is joined by the Little Atchafalaya. Grand River below Bayou la Rompe is about 300 feet wide.

Seventy-second mile.—The left bank for 600 feet from the head of this mile is formed by a narrow point between the river and Ouski Bay; thence for 1,800 feet is the open lake called "Oxa" on Captain Leavenworth's chart, but universally known as Whisky Bay by the inhabitants and steamboat-men.

Seventy-third mile.—The river is 1,000 feet wide at the head of this mile, with a depth at low-water of 25 feet, but at the end of the mile narrows to a width of 500 feet, and increases in depth to 45 feet.

Seventy-fourth mile.—The left bank is bordered by a cypress swamp, and the right by fields once cultivated but now abandoned.

The width is nowhere less than 500 feet, and the shoalest section gave a depth of 35 feet.

Seventy-fifth mile.—The width and depth continue as on the seventy-fourth mile. At the lower end Big Tensas Bayou runs out to the south. Its width is 220 feet and depth 25 feet 200 feet below its head. A cross-section taken 200 feet above the head of Bayou Tensas, and another just below it, show a width of 600 feet in each case, but the depth below is 8 feet less than that found above.

The right bank above and below the Tensas is comparatively high, but not above overflow.

Seventy-sixth mile.—This mile has about the same width as the one above, with 32 feet on the shoalest section. Second Tensas leaves the river on the right bank about the middle of the mile. It is about 120 feet wide, but very shoal, and much obstructed by raft.

Seventy-seventh mile.—Third Tensas runs out through the right bank at the head of this mile, and fourth and fifth Tensas near the lower end. These bayous are from 50 to 60 feet wide, and all are much rafted and very shoal. A large amount of water runs out through them during floods, but very little at low-water. The entire left bank is bordered by a cypress swamp.

Seventy-eighth mile.—Here the river shoals to 18 feet at low-water, but its width continues about 600 feet Sixth Tensas runs out at the head of the mile. It is 25 feet wide, but rafted near its head. Below, the seventh, eighth, and ninth Tensas leave near each other. They are each about 100 feet wide, but rafted, so that at low-water they are practically closed. Tenth or Little Tensas is the lower one of these bayous, and is the only one now used for navigation; it is 120 feet wide and 18 feet deep at low-water, and is said to have cut out a great deal in the last few years. The left bank of the Grand is bordered by a cypress swamp.

Seventy ninth mile.—The width remains about 600 feet, and on the

shoalest section 15 feet was found at low-water. Six small bayous leave the river on the right bank, and two enter on the left.

Eightieth mile.—Four small bayous leave to the south. All are shoal. The width and depth of the river remain about the same as on the seventy-ninth mile.

Eighty-first mile.—Three small bayous run out to the south at the head of this mile, and near the end of it Bayou Little Pidgeon also leaves in the same direction. It was once navigable for swamp-boats, but is now rafted and closed.

Eighty-second mile.—The left bank is low and swampy. Along the right bank seven old bayou channels are found, which are more or less rafted.

Eighty-third mile.—The width is from 250 to 300 feet, with a depth of 28 feet on the shoaled section. Eight small bayous run out through the right bank. A 6-foot rise overflows the banks.

Eighty-fourth mile.—Ten small bayous run out on the south side. The north bank is along a cypress swamp. Traverse Flat, an open lake, is at the middle of the mile.

Eighty-fifth mile.—Bayou Maringouin enters the river here; it comes from the Mississippi at Morganza, but brings only drainage-water, except when the Mississippi is high, and water comes through Grand Levee Crevasse. Bayou Maringouin is 220 feet wide and 15 feet deep; its banks are low, mostly swampy. A bayou 50 feet wide runs out of Grand River, directly opposite the mouth of the Maringouin; it is rafted and has little current except during high-water.

Eighty-sixth mile.—There are five small run-out bayous on the south bank of this mile. At time of survey, with a stage of water 2.3 feet above zero, the north bank and half of the south bank were overflowed. The shoalest section gave a depth of 17 feet, and the narrowest place was 280 feet wide.

Eighty-seventh mile.—The depth down to the middle of this mile is 13 feet at low-water, but the last half of it shoals to 8.7 at same stage. The banks were under water at a stage 2.3 feet above extreme low. Here the "Narrows" commence, which were caused by the rafting of Lower Grand River and Bayou Sorrel, when Bayou Plaquemine was opened. Closing the lower outlet turned the water up this channel, and at the end of this mile is the upper block of raft that has floated in here from the Plaquemine. A narrow channel has been cleared out, but at the head of the

Eighty-eighth mile it is only 80 feet wide and 8 feet deep in the deepest part. Some of the trees growing on the rafted material are fifteen years old, and pilots state that formerly there was no raft or contraction of channel here. Narrow as the channel between the batture and tow-heads is, 50 feet or less, it is much choked by overhanging willows. The stage of water at time of survey was 1.8 feet above zero, yet both banks were covered fully a foot deep everywhere within sight.

Eighty-ninth mile.—This mile, like the one already described, is much obstructed by tow-heads, which have narrowed the channel very materially; in addition, the overhanging willows which have grown upon the tow-heads and battures now form a serious impediment to boats attempting this route. The old banks of the river, as they existed prior to the rafting period, show that the stream was once of practically the same dimensions here as above. The shoalest place in the principal channel, which is between the tow-heads and the right bank, has 8 feet through it at low-water, with a width of from 50 to 60 feet. The

current at the time of survey was very sluggish, a free float moving in the narrowest places only about 10 or 12 feet per minute.

Ninetieth mile.—The condition of this mile is very much the same as that of the eighty-ninth, except that the depth is 9 feet.

Ninety-first mile.—The width of river is about 100 feet, and the depth 10 feet on the shoalest section. A batture from 200 to 300 feet wide extends along the north bank. About the middle of the mile a swamp-drainage bayou 90 feet wide enters from the north, and below its mouth the current in the river is from 40 to 50 feet per minute.

Ninety-second mile.—At the head of the mile are two tow-heads, which narrow the bayou to 40 feet, and this channel is covered in completely by overhanging trees. The shoalest section gave a depth of 13 feet at low-water.

Ninety-third mile.—The channel is much obstructed by overhanging trees and tow-heads. The shoalest section gave a depth of 11 feet at low water. At the end of this mile the river widens out and is joined by the Plaquemine; below the junction, known as the "Park," it is called Lower Grand River. A pile breakwater was once built here to force the drift that came down the Plaquemine previous to its closure into the Lower Grand, but eventually this stream became choked with raft, and then the direction of the current was through the Upper Grand, carrying the drift with it. As a result of this there is to-day the raft blockade extending 5 miles up the Upper Grand.

LOWER GRAND RIVER.

First mile below mouth of Plaquemine.—About 1,500 feet below the Plaquemine is an old, abandoned railroad bridge, through which the steamboatmen have torn out a passage-way 60 feet wide for boats. The shoalest section on this mile shows a depth of 20 feet, and the narrowest place is 200 feet wide. The land on both sides of the river was formerly cultivated, and an old levee still exists on the left bank; the top of it is, however, considerably below high-water mark.

Second mile.—The width of the river is everywhere 200 feet or more, and the shoalest of the six sections sounded gave a depth of 22 feet. A small bayou enters from the left, but with a slight rise in the Grand the current is from the river into the swamps. The lands on both banks were formerly cultivated, but, owing to increased height of flood-line, have been abandoned.

Third mile.—The least width on this mile is 200 feet; depth of shoalest section 14 feet. The banks are now overflowed at high-water everywhere.

Fourth mile.—The least width is 200 feet, and depth on shoalest section sounded 20 feet. Both banks are covered with overhanging willow trees.

Fifth mile.—Same as for fourth mile, except that the depth on shoalest section was 18 feet.

Sixth mile.—At the middle of this mile the river divides, Bayou Sorrel running to the right into Lake Chicot, and the Grand turning to the southeast. Mr. Rivet, who lived here from 1840 to 1860, states that in 1851 the Grand below the Sorrel was as wide as it was above, and that the latter was but a small bayou. The Grand was rafted by the drift from Bayou Plaquemine, and is so completely filled with logs and mud that at low-water it is nearly dry. Bayou Sorrel, which commences at about the middle of the sixth mile, is now the continuation of the Grand

for all purposes of navigation; its width at low-water is about 140 feet in narrowest places, and available depth 19 feet.

Seventh mile.—The width is 150 feet in narrow places, and depth of shoalest section 18 feet. An ancient mound, 100 feet in diameter and 14 feet above high-water mark, is near the middle of the mile on the left bank. While Lower Grand River was navigable for steamers previous to the formation of the raft, Bayou Sorrel was closed by blocks of raft, which were removed before the war by the State snag-boat. The overhanging trees and a few snags are now the only obstructions.

Eighth mile.—The condition of this mile is about the same as that of the seventh.

Ninth mile.—The width in narrow places is 120 feet, but the depth is 24 feet on shoalest cross-section. Camron Bayou, which is 60 feet wide and 7 feet deep at its head, runs out near the end of the mile. It widens to 100 feet within a short distance, but is much choked by drift. Its banks are from 7 to 7½ feet high and the levee is 3½ feet, yet the high-water mark is high above it.

Tenth mile.—The width is 120 feet and the depth on shoalest section 23 feet.

Eleventh mile.—The least width is 150 feet and the depth on shoalest section 22 feet. Barry's Bayou enters from the north about the middle of the mile; it is 70 feet wide and has a strong current, bringing in the drainage-water from the swamps. The south bank is leveed and the lands on both sides were once cultivated, but are now abandoned on account of overflow.

Twelfth mile.—The width is 170 feet and depth 20 feet on shoalest section.

Thirteenth mile.—Width and depth same as for last mile.

Fourteenth mile.—Width in narrow places 140 feet, and depth on shoalest section 21 feet. Pidgeon Lake Bayou enters from the right near the end of the mile; its width is 150 feet and its depth 22 feet. At the time of survey the discharge of this bayou was greater than that of the Sorrel above the junction.

Fifteenth mile.—The depth of shoalest section on this mile is 33 feet.

Sixteenth mile.—Fifteen hundred feet below the head of this mile Bayou Sorrel enters Bayou Sorrel Bay, with but 8 feet on the bar at its mouth. The width of the bay is 650 feet, and it is much obstructed with raft and snags. The passage through it is near the right bank, and all soundings show log bottom. Near the end of the mile a block of raft extends out from the left bank more than half way across the bay, rising from 5 to 10 feet above low-water.

Seventeenth mile.—On this mile there is a broken line of old raft and tow-head islands with raft foundations, and among the logs and through openings between tow-heads much water finds its way to the left bank, forming a channel which from here down to the lake follows the left bank. For the upper half of the mile there is a good channel along the right bank 20 feet deep and 150 feet wide. Below there is but 5 feet at low-water on one hundred and eighteenth cross-section with log bottom. The steamboat channel at low-water is up Lake Chicot to Bayou Chène, up that to Jake's Bayou, thence to Rigaby's Bayou and down it to the head of Bayou Sorrel Bay, about 6 miles, the low-water depths being not less than 5 feet. By clearing the raft out of Bayou Sorrel Bay this tortuous course could be avoided, and the distance from Lake Chicot to Bayou Sorrel materially shortened.

As stated at the commencement of this report the operations of the survey were here suspended, owing to high-water. In September, 1881,

Assistant Engineer Hoffman completed the work by surveying the run-out bayous that connect Grand River with Lake Chicot and Grand Lake, commencing with the Little Atchafalaya. The following is taken from his report:

Little Atchafalaya is the first of the run-out bayous and is found on the sixty-sixth mile (Atchafalaya survey), where the Atchafalaya River ends and Grand River commences. It flows east for a distance of 3.4 miles and empties into La Rompe about one-half mile from the head of the latter. It, at the time of survey, was not navigable, being blocked with fallen trees. The width of the bayou between its regular banks is 150 feet, and least depth 9 feet, but during high-water in the Atchafalaya the banks are under water. The bayou is lined with overhanging trees and both banks are caving.

Bayou La Rompe leaves Grand River on the seventy-first mile and flows southeast for a distance of 9 miles, emptying into Lake Mongoulois. From its head to Devil Chute, a distance of 5.7 miles, it is 450 feet wide, with a good clear channel having 10 feet least depth. The banks for the first half mile and on the fourth mile are comparatively high and partly cultivated; in other places they are swampy and covered with overhanging trees. Near the end of the fourth mile are two bayous which carry off a portion of its water to Lake Fausse Point. From Devil Chute to its mouth the bayou narrows to about 175 feet, a great portion of the water going out to the swamps over the west bank. A portion of this water returns to the bayou near the end of the eighth mile, increasing its width to 500 feet; the depth of channel at this point, eighth mile, is 7 feet; below here it shoals to 3 feet to the lake, but it is often only 2 feet deep. The course of the bayou is mostly through a cypress swamp; at its mouth there is a sand bar formed of Mississippi River deposit, with many logs imbedded in it. Devil Chute connects Bayous La Rompe and Big Tensas, flowing into the latter; it is 800 feet long, 150 feet wide, and has a good clear channel of 20 feet depth. Bayou Big Tensas leaves the Grand on the seventy-fifth mile and flows in a south-southeast direction into Lake Mongoulois; it is 5 miles long. From its head to Devil Chute it averages 200 feet in width, and has a least depth of 15 feet; the banks at Grand River are comparatively high for half a mile. Below this point they are low and swampy and bordered with trees overhanging the stream. In this portion of the bayou there are two islands which are caving away. Below Devil Chute the bayou has a width of 400 feet; the banks are low and swampy. There are two outlets through the east bank into Lake Mongoulois before reaching the mouth proper, but they are small and blocked by obstructions. The bar at the mouth is similar in its formation to that at the mouth of La Rompe.

Little Tensas is the last and smallest of the bayous of this name, and the one now used at extreme low-water. It leaves Grand River on the seventy-eighth mile and runs south a distance of 2½ miles, a portion of its waters flowing into Lake Mongoulois and the balance into Bayou Rigarby. At its head the bayou is 100 feet wide, and 18 feet deep.

The east bank for the first mile has been cultivated, while the west bank is cane-brake; below the first mile the land on both sides is low and swampy. The east bank is cut up by little bayous running into the swamp; both banks are caving and covered with overhanging and fallen trees. About 1½ miles from its head the bayou widens out into Tensas Bay, receiving a large body of water from the other Tensas bayous. The bay has a 5-foot channel through it, either to the lake (Mongoulois) or Bayou Rigarby; but it is dangerous, owing to logs left from

the raft. The pass into Lake Mongoulois is deep and good; it is about 1,280 feet long, with high banks. Lake Mongoulois receives the waters of Bayous La Rompe, Big and Little Tensas; it is half a mile wide and 3 miles long; at its head it is supplied with water from Little Tensas and a few of the small bayous, while La Rompe and Big Tensas empty into it on the west bank. The eastern bank is cypress brake, and Bayou Chène forms its southern outlet, with a good 12-foot channel.

The upper end of the lake is much obstructed by logs, and has an average depth of 5 feet. Bayou Chène connects Lake Mongoulois with Lake Chicot, and is 5 miles long. The banks for the first 3 miles are above ordinary high-water, and prior to 1874 were cultivated; below this they are low, with overhanging trees. This bayou at its head is nearly 520 feet wide, with a good clear channel of not less than 20 feet depth to the head of the Crook Chène, just below the end of the first mile. Between this point and the head of Bayou Tarleton, end of second mile, the Chène is 340 feet wide and 30 feet deep. Between the second and fourth miles the bayou is 200 feet wide and 30 feet deep. Jake's Bayou enters the east bank on the fourth mile, and one bayou leaves by the west bank on same mile. Near the mouth the bayou is 270 feet wide and 37 feet deep, but shoals to 6 feet into Lake Chicot. Bayou Rigarby begins at the lower end of Tensas Bay and flows into the Sorrel; it is 7.8 miles long. The banks are low and swampy, except for 1½ miles, beginning at the end of the fifth mile; here the banks are so high that the land was formerly cultivated. The width is 200 feet and least depth 5 feet for the first mile. On the second mile the width is less, but the depth increases to 10 feet. On the third mile there are two openings into Lake Mongoulois, through which considerable water comes, and as a consequence the bayou below for 1 mile is considerably wider; then, as considerable water passes off to the south through a little bay, the bayou becomes narrow again. From the third mile there is a 20-foot channel to the Sorrel. At the end of the fifth mile Jake's Bayou takes off considerable water into the Chène. This bayou is 1.7 miles long; the banks are above ordinary overflow and covered with overhanging trees. The width is from 250 feet at the head to 140 feet at the lower end, and the depth throughout not less than 18 feet. Lake Chicot receives all the water from the Atchafalaya, between Butte La Rose and Bayou Sorrel, and discharges into Grand Lake. It is 3 miles long and about 1.6 miles wide, surrounded by cypress swamps, and has a 5-foot channel to Pass Chicot, which, however, is much obstructed by logs. Pass Chicot is 450 feet wide and a half mile long and 20 feet deep.

The several bayous furnish six routes for steamboat navigation, depending on the stage of water, between the Atchafaylaya (sixty-sixth mile) and Lake Chicot, viz:

	Miles.
Little Atchafaylaya, La Rompe, and Chène	19.4
Grand River, La Rompe, Devil Chute, and Chène	19.7
Grand River, Big Tensas, and Chène	21.5
Grand River, Little Tensas, and Chène	23.0
Grand River, Little Tensas, Rigarby, and Sorrel	24.3
Grand River, Little Tensas, Rigarby, and Jake	21.2

As the raft in the Atchafaylaya is cut out at each high-water, the material forming it passes down stream, some of it finding its way into Grand Lake, and some being caught in the bayous connecting the river and lake, forms new obstructions to navigation, or adds to those already existing; in consequence, many changes are liable to occur at each

high-water, and a route practicable during the low-water of one year might during that of the following year be worthless.

The shortest route from the Upper Atchafalaya to Grand Lake is down Bayou La Rompe. At the time of survey steamers could not pass this way except with a rise of 7 feet above low-water, on account of the bar at the entrance of the bayou into Lake Mongoulois. To make this route available at low-water, it is thought that the construction of five dams to close run-out bayous will be necessary. By doing this the water entering the bayou at its head will be concentrated on the bar, it is expected, sufficiently to scour out a channel of navigable depth into Lake Mongoulois. It is possible that more works will be needed, but only after the effect of the five proposed closures is known, will it be safe to locate them.

The following is the estimate for opening this route:

Five dams	$30,179 00
Clearing banks 21 miles, at $100	2,100 00
Contingencies, 20 per cent	6,455 80
Total	38,734 80

The present route at lowest water is by way of Little Tensas, and the bayous of this route are nearly separated from Lake Mongoulois. The proposed plan is to close the four remaining openings which connect with the lake, and for removal of the trees from the banks, so that the bayous, which are now increasing in size from caving of banks, will not be obstructed by overhanging trees.

The following is the estimate for clearing out this route:

Four dams	$14,500 00
Clearing banks 24 miles, at $200	4,800 00
Contingencies, 20 per cent	3,860 00
Total	23,160 00

In case locks are constructed at the head of the Plaquemine to connect Grand River with the Mississippi, the route which would be used almost entirely would be down Grand River to the Plaquemine, and the Attakapas trade would go down Lower Grand River and Bayou Sorrel to Lake Chicot. The navigation by this route would be fully as good as that by Little Tensas. Though the cost of improving this route would be considerably greater than that of either of the other two, the fact that they would be practically of no account in case of a change to the Plaquemine connection with the Mississippi might make it advisable to improve this longer route instead of either of the others, as the whole work would be necessary in case the change mentioned above was made.

The estimate for this work is $92,604.40.

Some other small works might be found necessary, but, if so, could be made after the main work of the improvement was finished and the effect known.

ESTIMATE FOR UPPER GRAND AT THE NARROWS, 5 MILES.

Clearing both banks 5 miles, back 75 feet	$2,000 00
Dredging tow-heads, 5,500 feet long, average width 60 feet, depth 12 feet, 146,666 cubic yards, at 20 cents	29,333 33
Total	31,333 33
Contingencies, 20 per cent	6,266 67
	37,600 00

To clear a full width for the whole length of the "Narrows" to enable steamers to pass anywhere, 400,000 cubic yards of dredging in addition

to the above would be required. In all probability this would not be required, as boats would be able to pass each other every mile or so with the 60-foot cut, and the tendency would be towards an increase of width from scouring.

ESTIMATE FOR LOWER GRAND RIVER AND BAYOU SORREL, TO CONNECT WITH LAKE CHICOT CHANNEL IN DEEP WATER.

Removal of overhanging trees on one side of Lower Grand River, 5½ miles.	$350 00
Removal of trees on Bayou Sorrel, both sides, 10 miles, at $200	2,000 00
Dredged cut through log pile, 1,000 feet long, 200 feet wide, 35,000 cubic yards, at 75 cents per yard	26,250 00
Dam, 2,000 feet long, 51,111 cubic yards, at 33⅓ cents	17,037 00
20 per cent. contingencies and engineering	9,167 40
Total	55,004 40
Upper Grand River	37,600 00
Grand total	92,604 40

Appended hereto is a list of bench-marks and elevations of bank and water surface.*

This survey was made in the summers of 1880 and 1881, being between the great floods which occurred in the springs of 1874 and 1882. It is proper to note that this last flood has undoubtedly made a very material change in the river since the survey, not only with regard to the location of the channel, but with the amount of water which passes down the river. Ever since the partial removal of the raft each recurring flood has made an increase in the amount of water entering the river, and has caused the abandonment of cultivated lands. The levees which were constructed after the flood of 1874 were found utterly inefficient during the recent flood.

Capt. D. W. Lockwood, Corps of Engineers, who passed into the Atchafalaya on the 10th of last March, reports that on that day the Atchafalaya at its head was apparently filled with Mississippi River water, no Red River water showing on the surface, the latter passing over the country to the west and gradually showing itself in the Atchafalaya, so that at Simmsport, about 5 miles from the head of the Atchafalaya, about one-third of the latter appeared to be Red River water. There is no doubt in my mind that unless some action is taken soon to control or limit the influx of water, the Atchafalaya will so enlarge as to have a very marked effect upon the Mississippi River, and cause the abandonment of a very considerable area of cultivated land between Bayous Lafourche and Teche.

During the present flood the water at Charenton, on the Teche, on April 13, reached a point 12 feet 1½ inches above medium tide, being 5 feet above the flood of 1874 and 9½ inches above the highest point of land between the Teche and Grand Lake.

It is evident that no plan for improving the Atchafalaya, further than that already mentioned, is worth considering until something definite is done at the head; and as this is intimately connected with the Mississippi River problem, I have no recommendations to make until the Mississippi River Commission shall have taken action.

A tracing of the chart in eleven sheets accompanies this report.

Very respectfully, your obedient servant,

AMOS STICKNEY,
Major of Engineers.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

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* Not printed.

EXAMINATION OF BAYOU GRAND CAILLOU, LOUISIANA.

UNITED STATES ENGINEER OFFICE,
New Orleans, La., April 25, 1882.

GENERAL: I have the honor to submit the following report of Assistant Engineer H. S. Douglas on the examination of Bayou Grand Caillou, Louisiana, together with a tracing of the chart. The recommendations of Mr. Douglas, with regard to extent, method, and cost of improvement, are concurred in.

Very respectfully, your obedient servant,

AMOS STICKNEY,
Major of Engineers.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

REPORT OF MR. H. S. DOUGLAS, ASSISTANT ENGINEER.

NEW ORLEANS, *March* 29, 1882.

SIR: The following report on the examination of Bayou Grand Caillou, Louisiana, is respectfully submitted.

In obedience to the instructions of Maj. C. W. Howell, after the examination of Bayou Black had been completed, I had party and outfit transferred to Bayou Grand Caillou. Material assistance in the way of transportation, &c., was furnished by Messrs. H. C. Minor and D. S. Cage.

The initial point of the examination line was taken at the bridge of the Woodlawn Plantation, and from that point to the mouth of the bayou in Caillou Bay, a distance of 38 miles, a careful examination was made. No accident or delay worthy of mention occurred, and the field work was completed in nine days, from May 25 to June 2, inclusive.

The method of conducting the field work was the same as on Bayou Black. Bayou Grand Caillou must at one time have been quite a large sediment-bearing stream, as the present width of its original channel is from 400 to 600 feet, and the strip of alluvial land between either bank and the swamp is wide and high. Its connection with the Mississippi River was via Bayous Lafourche and Terrebonne, leaving the latter bayou at about the point where the town of Houma is now located. The decadence of this bayou may be traced to the same causes as have almost closed the Terrebonne and the Black. When it ceased to be an outlet of the Mississippi it became a tidal bayou, with only a slight current occasioned by the ebb and flow of the tide and the local drainage. This current was not sufficient to keep the cut grass and reeds from encroaching on the open channel, and the drainage from cultivated lands carried in a large amount of sediment which, the slight current being unable to carry off, settled to the bottom and assisted the other causes at work to close the bayou as a navigable stream. At present the uppor portion of the bayou is nothing but a willow swamp. Above the commencement of the present examination this swamp grows gradually narrower until it ceases to exist even as a ditch, and the flow is run clear across what was the former bed of a large bayou, now only indicated by a slight depression from the general level of the land. The following is a detailed description of that portion of the bayou covered by the examination line:

First, second, and third miles.—The bayou is nothing but a willow and cypress swamp, from 300 to 400 feet wide, with no trace of an open channel. The bottom is an exceedingly soft mud, covered with from 1 to 3 feet of water, and supporting a thick growth of cut grass and aquatic plants. The banks on either side are sugar plantations.

Fourth and fifth miles are about the same, except that there are slight indications of an open channel meandering the swamp.

Sixth mile.—At the commencement of this mile Bayou Pelton enters from the west. This bayou is one of the drains of the swamp lying between Bayous Grand Caillou and de Large. Below its junction with Grand Caillou there is an open channel, 4 to 6 feet deep and 20 to 30 feet wide. I was informed that the bayou had been partially cleared out up to this point. This open channel meanders the swamp, which is from 500 to 600 feet wide, but never quite touches the high land on the edge of the swamp. Near the end of this mile Bayou le Carp, another swamp drain, enters from the west.

Seventh, eighth, and ninth miles.—The open channel has a depth of 5 to 7 feet, and width of 30 to 50 feet. The banks, with the exception of the last half of the ninth mile, are overhung with live oaks. Swamp varies from 400 to 600 feet in width, and the lands on both banks are cultivated in sugar-cane.

Tenth, eleventh, and twelfth miles.—Open channel has a depth of 6 to 8 feet, and width of 40 to 80 feet. There are few obstructions, and the swamp, which is from 300 to 400 feet in width, is much more open and becomes more of a marsh than a swamp.

Thirteenth mile.—The water commences to be salt, and the floating grass which exists in the bayou above ceases. Channel from 5 to 7 feet deep, and 80 to 150 feet wide. Both banks cultivated.

Fourteenth mile.—Bayou du Lac, a larger bayou than Grand Caillou, enters from the east. It is the outlet of Lake Quitman, a large sheet of water lying in the marsh between the two Caillous, and from it a canal has been cut into Little Caillou, thus connecting the two bayous. At the junction of the Du Lac there is a bar in Grand Caillou on which there is only three feet of water at low-tide. This bar is about 300 feet long, and is composed of soft mud. Below this the bayou has a width of 150 to 200 feet and a depth of 11 to 20 feet.

The swamp ceases, and there is only a strip of marsh between the water's edge and the high banks. The current runs either way, depending upon the tide.

Fifteenth, sixteenth, seventeenth, and eighteenth miles.—Bayou averages about 200 feet in width by a depth of from 12 to 17 feet. The strip of high land on either bank narrows down until it is only from 200 to 300 feet wide, back of which is the sea marsh. This strip of land is generally under cultivation. Near the end of the sixteenth mile Bayou la Cere enters from the east, and on the seventeenth mile Mound Bayou enters from the west.

Nineteenth to thirty-eighth mile, inclusive.—The high banks grow less until they finally merge into the sea marsh, which is intersected by numerous lakes, bayous, and lagoons. the addition of which increases the bayou in width until it is from 800 to 1,000 feet wide by a least depth of 12 feet. From the twenty-fourth mile to the mouth it is nothing more than a sea-marsh bayou.

Bayou Grand Caillou debouches into Caillou Bay, an arm of the Gulf of Mexico. There is no bar at its mouth, but I am informed that there is only from 6 to 7 feet of water in Caillou Bay. Mr. Luke, a pilot in these waters, informed me that vessels entering or leaving Grand Caillou never drew more than 7 feet. All the general information contained in the report on the examination of Bayou Black, in reference to cut grass, logs imbedded in the bottom of the bayou, &c., will also apply to Grand Caillou, and to avoid repetition I respectfully refer to that report.

COMMERCE.

No very detailed information in regard to the commerce to be benefited by the improvement of this bayou could be obtained.

In the year 1880, about 3,500 hogsheads of sugar and 5,000 barrels of molasses, with the usual miscellaneous country produce, were raised on Bayou Grand Caillou.

IMPROVEMENTS.

As the general characteristics of Bayous Black and Grand Caillou are identical, the same plan of improvement is submitted for the latter as for the former, viz, to dredge a tide-water channel, 4 feet deep and 30 feet wide, from the junction of Bayou Pelton to the Woodlawn plantation, a distance of 5 miles; remove overhanging trees, straighten abrupt bends, and dredge out all shoals as far as the junction of Bayou du Lac. The parties interested seem to be of the opinion that a 4-foot channel will be sufficient for all vessels likely to navigate the bayou.

The following is an estimate of the cost of the proposed improvement, based upon the cost of the work already done in Bayou Terrebonne:

Dredging channel 4 feet deep, 30 feet wide, for 5 miles, at $1,200 per mile	$6,000
Removing overhanging trees and other obstructions, straightening abrupt bends, and deepening shoals for 8 miles, 1,000 feet, between Bayous Pelton and du Lac, at $400 per mile	3,280
	9,280
Add 10 per cent. for contingencies	928
	10,208

Should the proposed improvement be carried out, parties owning land on the bayou should be prevented from running their drainage ditches into it, as bars would be sure to form at the entrance of all such drains, and would require to be constantly dredged out. The natural drainage is back towards the swamps.

A chart on the scale of $\frac{1}{5000}$ accompanies this report.

Very respectfully, your obedient servant,

H. S. DOUGLAS,
Assistant Engineer.

Maj. AMOS STICKNEY,
Corps of Engineers, U. S. A.

EXAMINATION OF BAYOU LITTLE CAILLOU, LOUISIANA.

UNITED STATES ENGINEER OFFICE,
New Orleans, La., April 24, 1882.

GENERAL: I have the honor to submit the following report of Assistant Engineer H. S. Douglas on the examination of Bayou Little Caillou, Louisiana, together with a tracing of the chart.

The recommendations of Mr. Douglas, with regard to the improvement of this bayou, and the estimate of cost, are concurred in.

Very respectfully, your obedient servant,

AMOS STICKNEY,
Major of Engineers.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

REPORT OF MR. H. S. DOUGLAS, ASSISTANT ENGINEER.

NEW ORLEANS, *April* 1, 1882.

SIR: I have the honor to submit the following report on the examination of Bayou Little Caillou, Louisiana.

Immediately upon the completion of the work on Grand Caillou, I embarked my party and camp equipage in the three skiffs which had transported us thus far, and after a rather dangerous voyage of about 35 miles through the bays and lakes lying between Last Island and the main land, arrived safely on the banks of Little Caillou. The examination of Little Caillou was commenced on June 6 and completed on June 10. Total lengths of bayou examined, 28 miles, 1,500 feet. The field work was conducted in the same manner as on Bayou Black. The line was commenced at a point in the sea marsh where the shoalness and narrowness of the bayou seemed to preclude navigation, and continued as far up as the bridge of Brown's plantation, above which parties interested in the improvement of the stream did not consider it necessary.

As a general description of Little Caillou would be but a repetition of that already given for Bayous Black and Grand Caillou, it is omitted.

Like them it was at one time an outlet bayou of the Mississippi River, via the Lafourche and Terrebonne, leaving the latter bayou at a point 4¼ miles south of the town of Houma. It has ceased to be navigable for like reasons, and it is at present in about the same condition.

The following is a detailed description, by miles, measured in the direction in which the examination was made:

First, second, third, fourth, and fifth miles.—Little Caillou is a sea-marsh bayou with numerous bayous intersecting. and bays opening into, it. It is deep or shoal, narrow or wide, dependent upon the tidal currents between the bays which it connects, varying from 60 to 350 feet in width, and from 2 to 11 feet in depth. Bayou Couteau, an opening on the east, near the end of the fifth mile, is the channel generally used by any craft coming down the bayou that far, to make their exit from Little Caillou.

Sixth, seventh, and eighth miles.—The banks are slightly above the general level of the sea marsh, and have live oaks growing on them. Bayou 120 to 150 feet wide, and 3 to 4 feet deep.

Ninth mile.—Average width, 140 feet, by a depth of 4 to 6 feet. The high land between the bayou and the sea marsh is about 100 feet wide, and is partially under cultivation. On the east bank, near the beginning of this mile, is Mayo's Cut-off, a canal opening into one of the arms of Terrebonne Bay; and 400 feet above it, on the west bank, is Big Cocodrie, a sea-marsh bayou.

Tenth, eleventh, twelfth, thirteenth, and fourteenth miles.—Bayou averages from 110 to 150 feet wide, by a depth of 6 to 8 feet. High banks grow wider, and are more thickly settled.

Fifteenth mile.—There commences to be a strip of marsh between the bayou and the high banks. On the west bank is Robinson's Canal to Lake Quitman, now closed by a dam. Bayou 100 feet wide and 4.5 feet deep.

Sixteenth, seventeenth, and eighteenth miles.—The bayou decreases gradually to 50 feet in width, by a depth of 5 feet. Marsh about 250 feet wide from high bank to high bank. Cultivated lands on both sides of bayou.

Nineteenth mile.—On the east bank near the beginning of this mile, is the Lacache Canal, which connects Little Caillou with Bayou Lacache, and through it with the

Terrebonne. Through this canal the principal part of the commerce of Little Caillou passes. Near the end of the mile, on the west bank, is Boudro's Canal to Lake Quitman, and thence to Grand Caillou. From the entrance of this canal to nearly the end of the twenty-fourth mile the bayou has been improved by the dredging of a channel, with a least width of 25 feet and least depth of 4 feet. This work has been done by private enterprise, and has already been of great benefit.

Twentieth, twenty-first, twenty-second, twenty-third, and twenty-fourth miles.—Dredged channel ends at 23 miles 3,900 feet, and beyond it the bayou is practically closed. The influence of the tide is felt to this point. Sugar plantations on both banks. Marsh 200 to 250 feet wide.

Twenty-fifth mile.—Bayou choked with cut grass and water-weeds, which act as a dam, retaining the waters above. Marsh 150 to 200 feet wide, with a few willows growing in it.

Twenty-sixth mile to end of examination line at 28 miles 1,500 feet.—Bayou is a soft marsh, with willows and a few palmettoes growing in it. There are occasional open pools of water, but it is mostly grown up with cut grass and water-weeds. Above this it was not thought necessary to continue the examination, as the bayou grew very much worse.

No definite information as to the commerce of this bayou could be obtained, but as it traverses a thickly settled district, it is thought that it would be equal to that of Grand Caillou.

It is probably the intention of the parties interested in the improvement of Grand and Little Caillous, to have them act as feeders of the through route from New Orleans to the Atchafalaya. This route is as follows: New Orleans to Barataria Bay by several canals and bayous; Barataria Bay to Bayou Lafourche by canal; Bayou Lafourche to Bayou Terrebonne by canal; Bayou Terrebonne to Bayou Black by canal; and thence to the Atchafalaya. At present vessels can and do go from New Orleans to Bayou Terrebonne by this route. Further information in reference to this will be found in the "report on the survey and examination of Barataria Bay, &c.," and in the "report on the examination of Bayou Black."

IMPROVEMENT.

The same method is suggested as for Grand Caillou, viz, to widen the channel already excavated from Boudro's Canal to near the end of the twenty-fourth mile to 30 feet, and remove all obstructions from it. Above that point to dredge a 4-foot channel 30 feet wide to the end of the examination line, a distance of 4 miles 2,900 feet.

The following is an estimate of the cost of the improvement, based upon the cost of the improvement of Bayou Terrebonne:

Widening existing channel to 30 feet and removing all obstructions 4 miles, at $300 per mile	$1,200
Dredging channel 4 feet deep, 30 feet wide, for 4 miles 2,900 feet, at $1,200 per mile	5,520
	6,720
Add 10 per cent. for contingencies	672
Total	7,392

At present no improvement is required below Boudro's Canal, as it is probable that all vessels, from both below and above, on Little Caillou will go through the Lacache Canal into Bayou Terrebonne.

Drainage into the bayou should be prevented for the same reasons as given in the report on Grand Caillou.

Further information will be found on the accompanying chart.

Very respectfully, your obedient servant,

H. S. DOUGLAS,
Assistant Engineer.

Maj. AMOS STICKNEY,
Corps of Engineers, U. S. A.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 173.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING,

In response to a Senate resolution of December 21, 1881, *a letter from the Chief of the Bureau of Statistics and its inclosures regarding the rates of wages paid in the United States, in Great Britain, in France, in Germany, and in Mexico.*

MAY 11, 1882.—Referred to the Committee on Finance, and ordered to be printed.

TREASURY DEPARTMENT, *May* 9, 1882.

SIR: Under the resolution of the Senate, dated December 21, 1881, directing the Secretary of the Treasury to furnish the Senate with the present rate of duties in tabular form, imposed by France, Germany, and Mexico on the manufactures of the United States, when imported to those countries, &c., and under the further resolution of the same date relating to rates of wages, &c., I have the honor to transmit herewith a copy of a letter from the Chief of the Bureau of Statistics, and its inclosures, regarding the subject last mentioned.

Very respectfully,

CHAS. J. FOLGER,
Secretary.

Hon. DAVID DAVIS,
President United States Senate.

TREASURY DEPARTMENT,
BUREAU OF STATISTICS,
Washington, D. C., May 1, 1882.

SIR: I have the honor to submit to you herewith a report in regard to the subject of wages in the United States, and in foreign countries.

This report has involved a somewhat laborious investigation. It has been prepared in response to Senate resolution of December 21, 1881.

Very respectfully,

JOSEPH NIMMO, Jr.,
Chief of Bureau.

Hon. CHAS. J. FOLGER,
Secretary of the Treasury, Washington, D. C.

TREASURY DEPARTMENT,
BUREAU OF STATISTICS,
Washington, D. C., May 1, 1882.

SIR: I have the honor to submit to you the following report in regard to the relative rates of wages paid for labor in certain manufacturing industries in the United States, Great Britain, France, and Germany. This report has been prepared in compliance with your letter of December 27, 1881, transmitting to me two resolutions of the Senate, for investigation and report, both of which resolutions are dated December 21, 1881. The two resolutions are as follows:

(1.) *Resolved*, That the Secretary of the Treasury be, and he is hereby directed to furnish the Senate, as soon as possible, the present rates of duties, in tabular form, imposed by France, Germany, and Mexico on the manufactures of the United States when imported into those countries, especially on the various manufactures of cotton, wool, iron, and leather, and in like form to inform the Senate at what rates like manufactured articles are allowed to be imported into those countries from Great Britain, if he has such information in his department, and that he also inform the Senate what articles of American manufactures or other products of the United States are prohibited from introduction into said countries.

(2.) *Resolved*, That the Secretary of the Treasury be directed to communicate to the Senate in tabular form the rates of wages paid in the countries referred to in Senate resolution of inquiry directed to him and adopted December 21, 1881, to operatives engaged in the manufactures therein referred to, or those similar thereto.

My reply to the first of these resolutions was submitted to you January 13th, 1882, and has since been printed as Senate Ex. Doc. No. 52, Forty-seventh Congress, first session. The present communication, in reply to the second resolution, is the result of an investigation involving considerable research and reflection. It has, therefore, required much more time for its preparation than my reply to the first resolution.

While I have been able to collect a considerable amount of interesting and valuable information upon the subject-matter of the resolution, it has been found to be utterly impracticable, at the present time, to prepare an accurate comparative statement, exhibiting in tabular form, the rates of wages paid in the United States, in Great Britain, in France, in Germany, and in Mexico in the various manufactures of cotton, wool, iron, and leather. In order to prepare a statement giving such information with even approximate correctness, it would be necessary to collect a large amount of data in regard to wages paid for labor in the different countries referred to in the resolution. It would also be necessary to institute a somewhat extensive investigation as to the various conditions affecting the wages of labor in different countries. This, it is believed, will be made clear from a consideration of the following circumstances, which in a greater or less degree render it impracticable to prepare from data now available such a comparative statement of the rates of wages as is contemplated by the resolution.

First. Such data is not contemporaneous. It has been collected not

only at different periods, in the same year, but in different years. As the wages of labor are greatly affected by the commercial and financial condition of the several countries at different periods, even contemporaneous wages might fail to supply the data necessary for the preparation of a satisfactory comparative statement, since the periods of commercial depression and of commercial prosperity do not occur simultaneously in the various countries. In order to arrive at a correct comparison, it would appear to be necessary, therefore, to take the average of wages in different countries for a period of years.

Second. The hours of labor each day are different in the several countries. I am unable at the present time to obtain full and complete data upon this point.

Third. In the several countries mentioned in the resolution there are differences in the organization of labor, especially with regard to the subdivision of employments. These differences would, of course, vitiate any comparison based solely upon data in regard to wages actually paid.

Fourth. The wages paid for labor in different countries are more or less affected by arrangements in regard to the boarding of operatives, and the providing of tenement houses for the families of operatives. Such arrangements generally relate not only to the price of board and the rental of tenements, but also to the quality of food supplied as well as to matters relating to the comfort and health and the social and moral condition of operatives.

Arrangements, such as those just described, are made by the owners of many of the larger woolen mills of New England.*

It is impossible to distinguish between wages paid in the United States, which do and which do not embrace arrangements of the character here referred to. I am also unable at the present time to ascertain to what extent such arrangements affect the data in regard to wages paid in other countries.

Fifth. The relative rates of wages in different countries are affected by the degree of regularity of employment. Upon this subject Mr. Joseph D. Weeks says: "Work at full time can be done for considerably less than work at half time." (Inclosure A.) He adds that in woolen and cotton mills especially, employés in this country generally have full-time work, whereas in England the work is quite irregular.

Sixth. The wages of labor in the manufacturing industries of the several countries are greatly affected by the relative extent to which production depends upon human skill and upon the use of machinery. The introduction of machinery into many of the mechanic arts has completely changed the conditions under which human labor is employed.

In this connection attention is invited to the statement presented by Mr. Edward Atkinson, of Boston (inclosure H). Mr. Atkinson says:

* This statement is confirmed by Hon. Jonathan Chace, member of Congress; by Hon. Carroll D. Wright (see inclosure L), and also by Mr. Joseph D. Weeks (see inclosure A).

The use of machinery and the cost of the products of such machinery depend upon the intelligence, manual skill, and physical ability of the operative who directs it. Most of the work being done by the piece, the operative who earns the highest wages working on "piece-work" produces cloth at the lowest cost.

It may be observed here that the rates of wages paid to skilled labor in the cotton factories of the United States are determined mainly by conditions governing the rates of wages generally, and that the low cost of goods made by machinery is due chiefly to the wonderful economies which have been effected by the introduction of improved machinery. The fact that the more highly skilled and better-paid laborers produce goods at the lowest cost is one which has generally been recognized in employments where a high degree of skill is necessary in the application of manual labor. This applies in industries in which machinery is employed, as well as in industries in which machinery is not employed. The two facts of high rates of wages, and low cost of goods made by machinery do not, therefore, in any marked or peculiar manner, bear to each other the relationship of cause and effect.

Seventh. Wages in certain industries are paid, not by the day, but "by the piece." Skilled laborers in the manufacture of iron are generally paid by the ton. In the manufacture of cotton goods, a large proportion of the laborers are paid by the yard. In these two industries, as well as in others, the amount earned by the laborer per day or per week depends not only as above stated, upon the relative extent to which manual labor and machinery are employed, but also upon the kind of machinery employed, the intellectual and physical characteristics of the operative, the relative amount of labor required in the manipulation of the raw material chiefly used, and the methods pursued in the manufacturing establishments of the different countries.

The actual earnings of labor in the different countries are also greatly affected by the extent to which the employment of labor is regulated or influenced by trades unions and manufacturers associations. The requirements of such organizations apply to the hours of labor, to the wages of labor, and to the amount of labor which shall be performed within a given period of time. These requirements perhaps exert a greater influence over the employment of labor in Great Britain than in any other country.

To the difficulties already enumerated, which present themselves in any attempt to prepare a statement exhibiting in tabular form the relative rates of wages paid in the manufacture of iron and leather, and of cotton and woolen goods in different countries, must be added the fact that there is reason to suppose that, to some extent, data now available, have been collected carelessly or in a perfunctory manner. It is also asserted, upon apparently good authority, that in certain instances data in regard to wages are vitiated by willful perversion of the truth.

This office has not sufficient light upon the intricate and complex

subject of the comparative rates of wages in different countries, and in different employments, in order to pass upon the question as to the accuracy or inaccuracy of statements which to a greater or less extent are accepted as being correct. I am clearly of the opinion, however, that it would be utterly misleading to attempt to prepare a statement of comparative wages from data collected in different countries, at different times, by different men, who omit to take into consideration the various circumstances hereinbefore mentioned, and who record the results of their observations and inquiries in the absence of any harmonious effort to reach a properly comparative statement, or whose efforts are not directed by a single person competent to conduct a general inquiry upon the subject.

Notwithstanding the difficulties which now present themselves in the effort to prepare a comparative statement in regard to wages, such as that contemplated by the Senate resolution, I have deemed it my duty, in so far as might be possible, to collect such information as would enable me to prepare, during the present session of Congress, a reply to the resolution. The results of my inquiries and investigations are embraced in the following statements in regard to the relative rates of wages paid in different countries in the manufacture of iron and leather, and of cotton, woolen, and silk goods.

WAGES PAID IN THE MANUFACTURE OF IRON.

Attention is invited to the statement prepared by Mr. Joseph D. Weeks, of Pittsburgh, Pa., a gentleman who has devoted a large part of his business life to the study of industrial questions (inclosures A and B). Mr. Weeks was formerly employed as a special commissioner of the State of Pennsylvania to investigate the relations of capital and labor in Europe with especial reference to the methods of settling disputes between employers and employed. He is now a special agent of the Census Office, and, as such, charged with the duty of preparing a report in regard to the employment of labor in the United States.*

Mr. Weeks states that not only in the United States but also in foreign countries nearly all skilled laborers in the manufacture of the various kinds of "finished iron," embracing rails, rods, sheets, band-iron, and hoop-iron, are paid by the ton, instead of by the day or week. That the *ton*, and not the *day*, is the proper unit of measure of wages in the manufacture of iron is also stated in a letter recently addressed to this office by Hon. Abram S. Hewitt, member of Congress from New York, a gentleman who has for many years been extensively engaged in the manufacture of iron.

The following table, prepared by Mr. Weeks, gives the wages per

*It is expected that this report will furnish information which may serve as the basis of a systematic and thorough investigation in regard to the comparative rates of wages paid for labor in the United States and in foreign countries.

ton paid to some of the more important classes of laborers employed in rolling-mills at Pittsburgh, and in South Staffordshire, and at Warrington, England.

Wages in iron rolling mills in 1878.

Character of work.		Pittsburgh, United States.	England.	
			South Staffordshire.	Warrington.
Boiling	Per ton	$5 00	$1.792	$1.792
Muck rolling	do	$0.65 to 0.75	0.286	0.271
Shingling	do	.773	0.285	0.252
Bar rolling	do	65	0.523	0.523
Bar heating	do	65	0.653	0.653
Guide rolling, § inches, rounds and squares	do	2 40	.....	1.409
Guide heating, § inches, rounds and squares	do			
Hoop rolling, 1 inch by No. 18	do	$4.00 to 4 80	1.260	1.269
Hoop heating, 1 inch by No. 18	do		0.518	0.550
Sheet rolling, No. 24	do	7 16	3.097	.....
Sheet heating, No. 24	do			

From the above table it appears that workmen employed in the boiling of iron in Pittsburgh received, in 1878, $5 per ton, whereas, in Staffordshire and at Warrington, England, they received only $1.792 per ton. In other words, boilers were paid in the United States nearly three times as much per ton as in England. Mr. Weeks also states that this comparison, if based upon the product of labor within a given period of time, would be even more favorable as regards the earnings of laborers in the United States than is shown by the comparison of wages *per ton produced*, owing to the fact that the iron manufactured in Pittsburgh is more readily boiled than in Staffordshire and at Warrington. (See Inclosure M.)

Again, it appears from the table furnished by Mr. Weeks that bar-heaters received 65 cents per ton in Pittsburgh, and 65.3 cents per ton in Staffordshire and at Warrington, or a little more in England than in the United States. Mr. Weeks states, however, that the *out-put* of the mills in Pittsburgh is much greater than in Staffordshire, the result being that while the *wages per ton* are nearly the same the *earnings per day* are fully twice as great in Pittsburgh as in England. Mr. Weeks asserts that this result is due to the greater effectiveness, both of the laborers and of the machinery employed in the mills of Pittsburgh. He adds that in this branch of the manufacture of iron a more highly skilled class of laborers is employed at Pittsburgh than in Engiand. He also states that in his opinion, taking the entire range of skilled labor embraced in the foregoing table, the average earnings are fully twice as great at Pittsburgh as in Staffordshire and at Warrington, England.

The average daily or weekly earnings of laborers employed in the

iron manufactories of the United States and of other countries of course depend both upon the average wages paid per ton and the average number of tons produced within a given period of time. The same thing is true in regard to other manufacturing industries in which labor is paid "by the piece."

Mr. Weeks also presents in Inclosure B a very interesting and instructive statement and series of tables in regard to the wages paid in the manufacture of pig-iron in the United States and in England. His general deduction from the facts presented is that in this branch of the iron industry the earnings of labor in the United States are somewhat more than 100 per cent. in excess of the earnings of labor in England.

Information furnished by Mr. James M. Swank.

In this connection, attention is invited to the two statements prepared by Mr. James M. Swank, secretary of the American Iron and Steel Association, in his official capacity as an expert in connection with the census of 1880, in regard to wages paid to laborers in the iron and steel industries of the United States (Inclosures C and D). The first of these statements relates to the wages paid for puddling in the United States and in England, and the second to the average daily wages paid in all the iron and steel industries of the United States.

WAGES PAID IN THE MANUFACTURE OF COTTON GOODS.

Attention is invited to the statements in regard to the various manufactures of cotton goods in the accompanying Inclosures E, F, G, H, and I.

The most satisfactory information which it has been possible to obtain in the entire range of manufactures as to the relative rates of wages in different countries is that furnished in regard to wages paid in the manufacture of thread by the Messrs. J. and P. Coats, of Pawtucket, R. I., and at Paisley, Scotland, and by the Clark Thread Company at Newark, N. J., and at Paisley, Scotland. The peculiar value of the information furnished by these two establishments consists in the fact that in each case the extent to which machinery is used, and the manner of its use, the organization of labor, the methods pursued in its employment, and the intellectual and physical abilities of the operatives in the two countries are so nearly alike, that the comparison as to wages appears to be almost perfect.

Information furnished by Messrs. J. & P. Coats.

The Messrs. J. & P. Coats, in a letter to this office, dated April 3, 1882, state that the average of all the wages paid to their operatives is 110 per cent. greater at Pawtucket, R. I., than at Paisley, Scotland. (See Inclosure E.)

Information furnished by the Clark Thread Company.

The Clark Thread Company, in a letter to this office, dated April 3, 1882, state that the average of all the wages paid by them to their operatives is 101½ per cent. greater at Newark, N. J., than at Paisley, Scotand. (See Inclosure F.)

Information furnished by Mr. Carroll D. Wright.

Attention is next invited to a statement prepared by Mr. Carroll D. Wright, chief of the bureau of statistics of labor of Massachusetts (Inclosure G). This statement was prepared by Mr. Wright for *Bradstreet's*, a commercial paper of New York City, and also in reply to a request from this office for the information. It is, perhaps, unnecessary to say that Mr. Wright is extensively quoted as an authority upon statistics relating to labor. This statement indicates the wages paid in the cotton manufactories of Massachusetts, and of Lancashire, England, and the weekly earnings and weekly expenses of families in the two cases. According to this statement, the earnings of the Massachusetts weaver are $5.64 per week, and of the Lancashire weaver $5.28 per week, the former being 6.8 per cent. greater than the latter; and the earnings of the Massachusetts weaver and two children are $10.30 per week, and of the Lancashire weaver and two children $6.96 per week, the former being 48 per cent. greater than the latter. The expenses of the Massachusetts weaver and his family are stated at $7.99½ per week, and of the Lancashire weaver and his family at $6.73½ per week, the former being 18.7 per cent. greater than the latter. In each case the expenses are based upon an adopted schedule of expenditures.

The wide difference between the statements made by Messrs. J. & P. Coats and the Clark Thread Company in regard to the relative rates of wages paid to operatives employed in the manufacture of thread in the United States and in Scotland, and the statement made by Mr. Carroll D. Wright in regard to the relative rates of wages paid for labor in the manufacture of cotton cloth in the United States and in England, affords a striking illustration of what has hereinbefore been stated as to the contradictory nature of available data in regard to wages.

Information furnished by Hon. Jonathan Chace.

I desire, also, to call especial attention to a letter addressed to this office by Hon. Jonathan Chace, a member of Congress from Rhode Island. Mr. Chace has devoted his business life mainly to the manufacture of cotton goods, and is now largely engaged in that industry as sole or joint proprietor of several establishments. He was asked to express his opinion in regard to the general question of wages paid to cotton-mill operatives in Great Britain and in the United States.

This he has done in his letter dated April 13 (Inclosure I), in which he sharply controverts the statements made by Mr. Wright.

Mr. Chace maintains that the weekly earnings of laborers in cotton mills in the United States exceed the earnings of similar laborers in England in a much greater degree than is stated by Mr. Wright, and also that the relative cost of living is much more favorable, with respect to the laborer in the United States, than is represented by that gentleman. In support of his own statements Mr. Chace shows, from data in his possession, that the average earnings of men, women, and children in three mills located in Massachusetts, amount to $7.06 per week, as against Mr. Wright's statement that the average weekly earnings of weavers, who are among the highest paid of the operatives, amount to only $5.64 per week. Mr. Chace says that he regards the average stated by himself for the three mills referred to ($7.06) as fairly representative of the wages paid in the cotton mills of the State of Massachusetts.

In controverting Mr. Wright's statement as to the relative cost of living in Massachusetts and in England, Mr. Chace points to the fact that enormous quantities of the principal articles of food consumed by mill operatives are produced in the United States, and thence exported to England; and also to the fact that a very large number of laborers annually emigrate from England to the United States, and that few, if any, return.

Mr. Chace estimates that the general average of weekly earnings of all cotton-mill operatives in the United States is about 62 per cent. greater than the general average of such earnings in England, and that the average earnings of weavers, and of the other more highly-skilled and better-paid laborers in the cotton mills of the United States, exceed the earnings of such laborers in England in a much greater degree.

WAGES PAID IN THE MANUFACTURE OF LEATHER.

The only information which I have been able to procure in regard to wages paid in the manufacture of leather is embraced in the statement presented herewith from the Shoe and Leather Reporter, of New York. This information will be found in inclosure J.

It is estimated by that journal that tanners receive $13\frac{1}{3}$ per cent. more in the United States than in Great Britain, $54\frac{1}{2}$ per cent. more than in France, and $57\frac{1}{2}$ per cent. more than in Germany, and that curriers receive $35\frac{1}{7}$ per cent. more in the United States than in Great Britain, $66\frac{2}{3}$ per cent. more than in France, and $93\frac{3}{4}$ per cent. more than in Germany.

WAGES PAID IN THE MANUFACTURE OF WOOLEN GOODS.

An attempt has been made to obtain from trustworthy sources recent and reliable information in regard to the comparative rates of wages

paid in the manufacture of woolen goods in the United States and in foreign countries, and the various conditions affecting such wages, but without success.

WAGES PAID IN THE MANUFACTURE OF SILK GOODS.

As the Senate resolution calls for information in regard to wages paid in the manufactures of iron and leather and of woolen and cotton goods, *or those similar thereto*, I have deemed it proper also to seek information in regard to wages paid in the manufacture of silk goods. Such information has been kindly furnished by Mr. William C. Wyckoff, secretary of the Silk Association of America, and is embraced in inclosure K. The general result at which Mr. Wyckoff arrives is that the rates of wages paid in the manufacture of silk goods in the United States are approximately twice as great as in England, three times as great as in Germany and France, and four times as great as in Italy. He also states that the conditions under which labor is employed in the manufacture of silk in the various countries are very different. In Europe a large proportion of the work is performed at the homes of the operatives, whereas in this country similar work is performed in the mill. Besides there are many differences in the entire detail of the management of operatives, and of the treatment of material in the various processes of manufacture.

In referring to these differences in the conditions under which the silk manufacture is carried on, Mr. Wyckoff says:

> No general statement would apply (in this respect) to all the silk factories in any one country—scarcely to all in a given neighborhood where they are numerous. A really valuable report on this subject could not be prepared by an expert in less than a year, and not without a personal investigation in Europe.
>
> Methods and systems in silk manufacture are subject to frequent changes, One of the most frequent changes is from time work to piece work, or the reverse. I could not undertake to ascertain the proportion of labor employed in each way; it differs with seasons and with fashions, with localities and with individual employers. But in the table I sent you (Inclosure K), this question does not arise, having been eliminated beforehand.

The wide differences in the circumstances and conditions under which silk goods are manufactured in the United States and in the countries of Europe, are also very clearly set forth in an extract from a work entitled "The Silk Goods of America," by Mr. William C. Wyckoff. (See Inclosure K.)

In view of what has hereinbefore been stated as to the various conditions affecting the employment of labor in the several countries mentioned in the Senate resolution, and in regard to the inadequacy and contradictory character of available data, it does not appear to be proper for me to attempt to present upon the authority of this office any general estimate of the relative rates of wages paid to operatives employed in the manufacturing establishments of the United States and of foreign countries. To do so would be in violation of the rule of official pro-

priety which debars the chief of this bureau from presenting, as authoritative, any statement in its nature conjectural or not based upon data sufficiently full and reliable to command general acceptance.

In consideration of the public interest in the subject, it is deemed to be entirely proper, however, in endeavoring to comply with the requirements of the resolution, to present in the form of a recapitulation the statements and opinions of persons whose utterances upon the subject command public attention and respect.

(A.) Hon. Abram S. Hewitt, member of Congress, who has had a arge experience in the employment of labor, especially in the manufacturing of iron, stated in a speech delivered in the House of Representatives on the 30th of March, 1882:

> That as between Great Britain and the United States the rate of wages is, on the average about 50 per cent. higher here than there.

Mr. Hewitt had in mind a great variety of employments and classes, of labor. He added, that—

> Skilled labor is much more highly paid in the United States than in Great Britain, while the difference in common labor is not so great as I have stated, but the tendency of modern industry is to introduce machinery by which the amount of skilled labor employed is steadily reduced.

(B.) Mr. Joseph D. Weeks, of Pittsburgh, Pa., states that the aver, age earnings of all the operatives employed in rolling mills and in the manufacture of pig-iron are fully 100 per cent. greater in the United States than in England.

(C.) Hon. Jonathan Chace, member of Congress from Rhode Island-states from a large experience as a proprietor and manager of cotton mills, that the average earnings of all operatives employed in the cotton mills of Massachusetts is about 62 per cent. greater than the average earnings of operatives in England, and that the average earnings of the more highly skilled classes of laborers in the United States exceed the earnings of similar laborers in England in a much higher degree.

(D.) Mr. Carroll D. Wright, chief of the Massachusetts bureau of statistics of labor, estimates that the average weekly earnings of a weaver in Massachusetts are only 6.8 per cent. greater than the average weekly earnings of a weaver in England, and that the average weekly earnings of a weaver and his two children in Massachusetts are 48 per cent. greater than the average weekly earnings of a weaverand his two children in England. (See Inclosure G.)

(E.) The two principal manufacturers of thread are the Messrs. J. and P. Coats, of Pawtucket, Rhode Island, and Paisley, Scotland, and the Clark Thread Company, of Newark, New Jersey, and Paisley, Scotland. The former of these state, from their experience in the payment of wages for similar work in the two countries, that the average wages paid by them in the United States are 110 per cent. greater than in Scotland. (Inclosure E.) And the latter that the average wages paid by them in the United States are 101½ per cent. greater than in Scotland. (Inclosure F.)

(F.) Mr. William C. Wyckoff, secretary of the Silk Association of America, says:

I regard it as entirely within bounds to state that there are paid for similar labor in silk manufacture in this counrry, approximately, twice as high rates of wages as in England, three times as high as in Germany and France, and four times as high as in Italy. (See inclosure K.)

(G.) It is estimated by the *Shoe and Leather Reporter* of New York, that tanners' wages in the United States range from 13⅓ per cent. to 57½ per cent. higher than in certain countries of Europe, and that curriers' wages in the United States range from 35⅐ per cent. to 93¾ per cent. higher than in those countries. (See Enclosure I.)

It seems to be quite generally conceded that the earnings of skilled laborers in the United States exceed the wages of skilled laborers in the countries of Europe, in a much higher degree than do the earnings of unskilled laborers in the United States exceed the earnings of unskilled laborers in Europe. This is a fact of national interest, as it indicates that there is a greater stimulus to higher attainment in mechanical employments in the United States than in Europe.

CONCLUSION.

The foregoing facts appear to indicate very clearly that it is impossible at the present time to comply fully and satisfactorily with the requirement of the Senate resolution touching the presentation in tabular form of the rates of wages in the United States and in foreign countries. The difficulty in the case arises both from the inadequacy and the contradictory character of available data. It is hoped, however, that the difficulties which have been pointed out may lead to such discussion and investigation as will tend to bring out information which shall command general acceptance without regard to its bearings.

The tendency of labor, in the principal mechanic arts, towards organization and confederation, especially during the last four or five years, and the influence which this phase of the labor question exerts upon the commercial and industrial interests of the country, also suggest the importance of a careful investigation of the whole question as to the conditions governing the rates of wages of labor in the United States and in those foreign countries in which the principal industries of this country meet competition.

Data, even if correct, showing only the comparative rates of wages paid in different countries, would present but a partial and very imperfect view of the general question as to the comparative cost of production in the several countries. It appears important, therefore, that any systematic and thorough investigation of the wage question should constitute a part of a more general line of inquiry embracing the hours of labor, the manner and extent to which machinery is employed, the relative proportion of men, women, and children employed, and the manner of their employment, the organization of labor, the rate of in-

terest upon capital, the cost of erecting factories, the cost of fuel in the several countries, and other matters having an important bearing upon the subject.

An investigation embracing a general consideration of the labor question, would involve inquiries in regard to the cost of living and in regard to the moral, intellectual, and social condition of the laboring classes.

Information in regard to the comparative rates of wages paid for labor in the different countries appears to be greatly needed in connection with the discussion of the tariff question, upon which question the information called for by the two Senate resolutions of December 21, 1881, has a direct bearing. Under the most favorable conditions the tariff question is one of great complexity, but it becomes obscure and interminable when the discussion of it involves not only the relevancy but also the accuracy of data employed to establish apparently fundamental propositions.

It is probable that an intelligent and thorough investigation of all the conditions affecting the wages of labor in the various countries would tend to correct many errors, and to reconcile many seeming discrepancies in the data now available.

Within the time which it has been possible for me to devote to the preparation of this report, I have used my best efforts to procure reliable data from gentlemen believed to be as competent as any in the country to give the desired information. The statements of fact and expressions of opinion furnished by those gentlemen are however presented entirely upon their own responsibility.

While from the force of circumstances hereinbefore explained it has been impossible at the present time to comply fully and completely with the requirements of the resolution of the Senate, it is hoped that the facts and considerations presented may serve to throw some light upon the subject, and to indicate the importance of instituting a thorough investigation in regard to wages and the conditions governing the employment of labor in the United States and in foreign countries.

I am, sir, very respectfully, yours.

JOSEPH NIMMO, JR.,
Chief of Bureau.

Hon. CHARLES J. FOLGER,
Secretary of the Treasury.

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[INCLOSURE A.]

WAGES IN CERTAIN MANUFACTURES.

[A letter addressed to the Chief of the Bureau of Statistics, by Joseph D. Weeks, esq., of Pittsburgh, Pa.]

DEPARTMENT OF THE INTERIOR, CENSUS OFFICE,
Pittsburgh, Pa., February 3, 1882.

DEAR SIR: I inclose to you herewith statements of wages paid at the tanneries, and in cotton and woolen mills, and iron rolling mills of the United States, and also in the rolling mills of England.

I find, on investigation, that I have no figures of wages paid in cotton and woolen mills or in tanneries outside of the United States, other than those collected by United States consuls, which appeared in the reports published by the State Department in 1878, to which I would refer you.

You will notice that I give in a number of these the hours of labor, which are, of

course, per diem, and a statement regarding the regularity of employment, which is an item of considerable importance. Work at full time can be done for considerably less than work at half time. I think it will be found in any comparisons that are made between the work in this country and the work abroad, that in woolen and cotton mills especially, our employés have generally full time work, whereas in England the work is quite irregular.

I should also say that at most of the cotton and woolen mills of New England, the arrangements made by the corporations for the boarding of operatives are such that the rates of wages per day, as compared with rates in other parts of the country, where such arrangements for boarding are not made, are greater, really, than they seem to be.

Regretting that I am able to furnish you with the statistics of wages abroad only in regard to the iron industry,

I am, respectfully,

JOSEPH D. WEEKS,
Expert, Special Agent.

JOSEPH NIMMO, Esq.,
Chief, Bureau of Statistics, Washington, D. C.

Wages at tanneries of United States for 1880.

Classes of employés.		Pennsylvania.	New York.
Beam hand	per day	$1 30	$1 33½
Yard hand	do	1 25	.....
Roller	do	1 25	1 50
Bark grinder	do	1 10	.....
Laborer	do	1 10	1 25
Hours of labor		10	10
Regularity of employment		Full time.	Full time.

Wages in cotton mills of United States for 1880.

Classes of employés.		Massachusetts.	New Hampshire.	New Hampshire.
Overseer	per day	$3 70	.....	$3 50
Second hand	do	2 00	.....	2 00
Picker	do	.....	.....	1 10
Card-stripper	do	1 00	.....	1 10
Frame-spinner	do	74	$0.52	82
Mule-spinner	do	1 58	.....	1 55
Back boy	do	.....	.....	45
Warper	do	92	78	92
Spooler	do	81	51	90
Dresser	do	.....	1 59	.....
Weaver	do	80	78	1 10
Hours of labor		10	11	10¾
Regularity of employment		Full time.	Full time.	Full time.

Wages in woolen mills of United States for 1880.

Character of work.	Massachusetts.	Maine.	New Hampshire.
Wool sorting.....per day..	$1 72	.....	$1 50 @ $1 85
Carding .....do....	70	$ 75	80 @ $0 90
Spinning .....do....	1 19	1 25	1 50 @ 1 75
Spooling.....do....	53	.....	75 @ 1 00
Dressing .....do....	1 17	.....	1 75
Drawing .....do....	80	.....	.....
Weaving .....do....	97	1 14	1 35 @ 1 60
Gigging .....do....	95	.....	1 15
Finishing .....do....	95	.....	.....
Hours of labor.....	10	11	11
Regularity of employment.....	Continuously, except a few days in spring, the mill stopped by back water.	Full time	Full time .....

Wages in iron rolling mills in 1878.

Character of work.	Pittsburgh, United States.	England.	
		South Staffordshire.	Warrington.
Boiling .....per ton..	$5 00	$1 792	$1 792
Muck rolling.....do	57c. to 65	286	271
Shingling .....do	77	285	252
Bar rolling.....do	65	523	523
Heating.....do	65	653	653
Guide rolling, rounds and squares, §..... Guide heating, rounds and squares, §.....} ..do	2 40	.....	1 409
Hoop rolling 1″ by No. 18..... Hoop heating 1″ by No. 18 .....} ..do	4 00 to 4 80	1 26 518	1 269 55
Sheet rolling, No. 24 ..... Sheet heating, No. 24.....} ..do	7 16	3 097	.....

[Inclosure B.]

WAGES IN THE MANUFACTURE OF PIG-IRON IN THE UNITED STATES AND IN ENGLAND.

[A statement prepared by Joseph D. Weeks, esq, of Pittsburgh, Pa.]

Pittsburgh, Pa., *April* 22, 1882.

Dear Sir: Referring to our conversation yesterday, I beg to inclose tables showing the rates of wages paid and the detailed cost of making pig-iron in Pittsburgh and in England in1879. I have no detailed statement of the English cost later than this, but from figures that I have, I am confident that the cost in this country compared with the cost in England would be relatively greater now than in 1879.

You will note that the tables show:

First. Referring to the rate per day paid the several classes of labor employed at the furnaces, as shown in Table 1, these rates are on the average nearly 100 per cent. greater in this country than in England. If I had the data for showing the actual average wage of each man employed about the furnace, the average wage would be fully 100 per cent. greater, as the number of men employed at the rates above $1 a day in England are much less than those employed at less than $1. For example,

in the Cleveland furnaces, eight in number, from which the figures are taken, 16 men are employed at the $1.40 rate and 44 at the 89-cent rate; 4 men at the $1.02 rate; 8 at 73-cent rate. It is evident that the average wage per man employed would be less than the average rate.

Second. Table 1 also shows the total cost of labor per ton of pig in each of the three districts. This is the labor at the furnace only, and does not show the cost of mining ore, &c. This table shows that the total cost of labor per ton of pig at Pittsburgh is 114 per cent. greater than in Cumberland, England, and 81 per cent. greater than in Cleveland, England.

Third. Tables 2, 3, and 4 show the various items of material, labor, and other elements of cost to a ton of pig-iron in the two countries and the cost of labor in the mining and preparation of the materials sufficient to make a ton of pig-iron. This added to the cost of labor at the furnace gives the total cost of labor to a ton of pig as $3.05 to $3.17 in Cleveland, England. and $5.18 in Pittsburg, exclusive of the cost of that labor which enters into the transportation of the materials from the mines and ovens to the furnace; that is taking $3.11 as the average cost of labor in Cleveland, England, the cost in Pittsburgh is a little less than 67 per cent. more than in Cleveland. It must be noted, however, that it requires 4 tons, 2,129 pounds, very nearly 5 tons of material, to make a ton of pig in England, and but 3.7 tons in Pittsburgh, or about 33⅓ per cent. more material in England than in this country, and this extra amount English labor has to mine and prepare at a much less price. Further, the labor of mining in England is much more laborious than in the United States, the coal mines are deeper and the ore veins thinner than those from which the Pittsburgh furnaces derive their supplies.

In this connection, also, it is proper to note the very large difference in the cost of transporting the materials required to make a ton of pig, $10.27½ in this country, as compared with $1.53 in England. I have not been able to make even an estimate of what part of this cost of transportation in both countries is paid for labor, but this, whatever it is, added to the labor cost of a ton of pig already given, would make the labor cost in this country more than double the labor cost in England.

Very truly,

JOS. D. WEEKS.

Hon. JOSEPH NIMMO, JR.,
Chief Bureau Statistics, Washington, D. C.

TABLE 1.—*Showing relative daily wages paid workingmen about blast furnaces in England and at Pittsburgh in* 1879.

Occupation.	Pittsburgh.	England.	
		Cumberland.	Cleveland.
Chargers	$1 60	$0 99	$1 40*
Fillers	1 50	99	89
Keepers	2 00	1 22	1 87*
Keepers' helpers	1 80	77	73
Laborers	1 20½	56	.....
Blacksmiths	2 00	1 15	.....
Engine-men	2 00	1 09	1 02
Total cost of labor per ton of pig	1 25	58 3/10	69

*Either these are mistakes or the work is different from that done by "chargers" and "keepers" in Cumberland.

Total cost of labor per ton of pig.

At Pittsburg, Pa	$1 25
In Cumberland, England	.58 3/10
In Cleveland, England	.69

TABLE 2.—*Showing the cost of pig-iron in the Cleveland district, England, for one-half year to March* 31, 1879.

[All minerals at about cost price. The company owns and raises its own minerals.]

	Quantity used.		Prices at works.	Cost per ton of iron.
	Tons.	*lbs.*		
Ironstone	3	565	$0.976	$3 20
Coal (calcining)		210		11
Coke	1	203	2 56	2 79
Limestone		1,151	89	45
				6 55
Wages				69
Stores and repairs				17
Rates and taxes				08
				7 49
A reduction of about 5 per cent., or, say				37
Will give about present (July, 1879) cost				7 12

TABLE 3.—*Showing the cost of a ton of pig-iron at the furnaces in the Pittsburgh district in the first part of* 1879.

[Ores are Lake Superior; coke, Connellsville; limestone from the Mahoning Valley.]

	Quantity used.	Prices at works.	Cost per ton of iron.
	Tons.		
Ironstone	1.7	$9 00	$15 30
Coal (calcining)	None.		
Coke	1.25	2 56⅜	3 20½
Limestone	75	1 15	71¼
			19 22
Wages			1 25
Stores and repairs			50
Taxes			10
			21 07

The cost in July, 1879, would be somewhat above this as the "boom" was in progress at that date.

TABLE 4.—*Wages paid to produce one ton of iron in Pittsburgh.*

Labor on mining ore for ton of pig-iron, at $1.40 per ton of ore	$2 38
Labor in mining coal and making coke necessary to produce a ton of pig-iron	1 25
Labor in mining limestone for ton of pig-iron	30
Labor at furnace	1 25
	5 18

Against $3.05 to $3.17 in Cleveland, England.

The average royalty per ton of ore in the Lake Superior mines is 44 cents, or 74.8 cents per ton of pig-iron. The average royalty on bituminous coal in Pennsylvania for 1879–'80, was 14 cents a ton, or 26 cents to a ton of pig-iron. On limestone the royalty to a ton of pig-iron would be about 4 cents, making total royalties $1.04.8 against 65 cents in England.

The transportation on ore sufficient to make a ton of pig-iron from Lake Superior to Pittsburgh furnaces is $8.07½; on coke from the Connellsville region to Pittsburgh, $1.60; on limestone, $0.60; making a total for transportation of $10.27½ against $1.53 in England.

[INCLOSURE C.]

STATEMENT IN REGARD TO THE WAGES PAID FOR PUDDLING IN THE UNITED STATES AND IN ENGLAND.

[Prepared by Mr. James M. Swank, secretary of the American Iron and Steel Association, in his official capacity as an expert and special agent of the Census of 1880.]

With reference to wages, a single illustration will show the disparity which exists in the iron and steel industries of this country and Europe. At Pittsburgh the price of puddling, or boiling, iron was fixed for one year on the 30th of May, 1881, in an agreement between the employers and their workmen at a *minimum* of $5.50 per ton, the price to be advanced if the price of bar-iron should advance beyond 2½ cents a pound. Of the $5.50 the puddler's helper receives about one-third. At Philadelphia, in an agreement between the employers and their workmen, on the 24th of July, 1880, the *minimum* price of puddling was fixed for an indefinite period, which still continues at $4 per ton, of which sum the helper receives about one-third. When the price of bar-iron is 2½ cents a pound the price of puddling is to be $4.50 per ton, the helper to receive about one-third. If the price of bar-iron advances beyond 2½ cents a pound the price of puddling is to be advanced. The Pittsburgh schedule of wages for puddling prevails in the western parts of the United States, and the Philadelphia schedule is fairly representative of the wages paid in eastern rolling-mills.

In England the wages of iron and steel workers are probably higher than in any other part of Europe. The north of England is the principal seat of the iron industry of that country. A board of arbitration and conciliation for the manufactured-iron trade of the north of England adjusts the wages of all rolling-mill workmen in the district every three months, upon the basis of the average net selling price of rolled iron during the three months preceding the month in which the board meets. The average net selling price of rolled iron for the three months which ended on the 30th of June, 1881 (a period of prosperity and good prices), was £6 2*s*. 2*d*., and the wages of puddlers for the three months beginning on the 1st of August was officially declared to be 7*s*. per ton, or about $1.75, of which sum the puddler's helper, in accordance with the English custom, receives about one-third. The official announcement of the adjustment of wages, dated July 29, is as follows: "In accordance with the sliding-scale arrangement and the resolution of the employers' meeting of February 24, the above-

named figure of £6 2*s*. 2*d*. gives 7*s*. per ton as the rate for puddling over the three months commencing on the 1st of August, and a reduction of other forge and mill wages of 2½ per cent. upon last quarter." This announcement is signed by J. R. Winpenny and Edward Trow, secretaries. The difference in puddlers' wages in the north of England and at Pittsburgh and Phila delphia in the same period of time is thus seen to be very great. The wages of other rolling-mill workmen correspond with the wages of puddlers in both countries.

[INCLOSURE D.]

STATEMENT SHOWING THE AVERAGE DAILY WAGES PAID IN ALL THE IRON AND STEEL INDUSTRIES OF THE UNITED STATES DURING THE CENSUS YEAR 1880.

[Prepared by Mr. James M. Swank, secretary of the American Iron and Steel Association, in his official capacity as an expert and special agent of the census.

The 140,978 persons who were employed in 1880 were paid $55,476,785 as wages, or an average of $393.51 for the year for each person. The average daily wages of skilled labor were $2.59; of unskilled labor, $1.24. The highest average daily wages of skilled labor were paid in Rhode Island, Colorado, and Wyoming Territory—$4; the the lowest in Nor th Carolina—$1.25. The highest average daily wages of unskilled labor were paid in Wyoming Terri tor y—$2; the next highest in Colorado and California—$1.75; the lowest in North Carolina—54 cents. It may be remarked of North Carolina that its iron industry in 1880 was wholly confined to the use of the primitive ore bloomary, and that the labor employed was largely that of colored men. The average wages paid in the four grand divisions were as follows: Eastern States, skilled, $2.70; unskilled, $1.21; Southern States, skilled, $2.69; unskilled, $1.03; Western States, skilled, $2.70; unskilled, $1.31; Pacific States and Territories, skilled, $3.50; unskilled, $1.75.

[INCLOSURE E.]

WAGES OF LABOR IN THE MANUFACTURE OF THREAD.

[Letters of February 2 and April 3, 1882, addressed to the Chief of the Bureau of Statistics by Messrs. J. & P. Coats, manufacturers of thread, at Pawtucket, R. I., and at Paisley, Scotland.]

PAWTUCKET, R. I., *February* 2, 1882.

DEAR SIR: I have to acknowledge the receipt of your favor of the 24th ultimo, and i n reply have the pleasure to hand you comparative rates of wages paid in our factories here and in Scotland.

Our manufacture is a specialty, requiring the employment of good, steady hands, it being impossible for us to maintain the quality of our goods with a floating class of help. The general average of female help in Scotland, you will observe, is under $3 per week, whereas here it averages nearer $7.50 per week. (Remember the difference in the time run between the two countries is deducted from the rates paid here to make the comparison more nearly correct.) The difference in male help is not so great; but the great bulk of those we employ are females. We are obliged to pay high wages as we have to employ help corresponding to the best class engaged in weaving and other highly paid departments of labor. Unless we do so, we find our help unwilling to remain with us steadily, subject to the strict discipline necessary to produce our quality of goods. These conditions apply to Scotland as well as here,

where our experience proves the help to be quite as efficient and able to attend to as many machines or spindles.

The great difference in wages between the two countries affects the prices of the various descriptions of supplies required in a factory in a corresponding ratio, and coal, gas, and taxes are likewise very much lower in Scotland than here, not to speak of the average rate of interest. Coal is laid down at our furnaces there for 3*s.* 9*d.* per ton, equal to about 90 cents. It is, of course, small coal but well adapted for handling with the automatic stoker and gives as good results as the coal used here, which averaged last year $4.70 laid down at the works. The price of 25 candle-power gas is 3*s.* 9*d.* per 1,000 cubic feet, equal to 90 cents, and taxes are less than one-third of what we pay here. Income tax, of course, you do not require to pay unless you make a profit, but this does not affect the calculation as you have to pay it on profit earned abroad as well as in Scotland. We employ there double the power we do here.

To the best of my judgment and experience a factory would cost fully twice as much to build here as in Scotland.

I deduct from the wages paid here an amount corresponding to the difference of time run during the week in the two countries.

Trusting that the information given sufficiently covers the ground as it represents the great mass of our employés,

I am, yours, very respectfully,

JAMES COATS,
Of J. & P. Coats.

JOSEPH NIMMO, Jr., Esq.:
Treasury Department, Washington, D. C.:

Schedule of wages paid in the United States and in Scotland, furnished by Messrs. J. and P. Coats, thread manufacturers.

	In the United States.	In Scotland.	Difference in favor of the United States.
Wages paid cop spoolers.....per week..	$6 59	$3 40	$3.19, or 94 per cent.
Twister-tenders.....do....	5 69	2 25	$3.14, or 123 per cent.
Doffers.....do....	4 37	1 94	$2.43, or 125 per cent.
Cleaners.....do....	2 63	1 52	$1.11, or 73 per cent.
Reelers.....do....	7 88	3 52	$4.36, or 124 per cent.
Winders.....do....	7 25	2 80	$.445, or 159 per cent.
Wrappers and boxers.....do....	7 96	3 04	$4.92, or 162 per cent.
Dyers.....do....	9 84	6 32	$3.52, or 56 per cent.
Bleachers—men.....do....	11 81	5 10	$6.71, or 132 per cent.
Bleachers—women.....do....	5 25	2 43	$2.82, or 116 per cent.
Mechanics.....do....	13 13	7 94	$5.19, or 65 per cent.
Firemen.....do....	10 66	5 83	$4.83, or 83 per cent.

PAWTUCKET, R. I., *April* 3, 1882.

DEAR SIR: Your favor of 29th was received, with inclosure, which I return as requested. The schedule of rates is a correct copy of what I gave you.

In reply to your first question, I would say that my firm manufacture more thread in Scotland than in the United States, but our factories here are sufficiently large to obtain the most economical results of general management, requiring twenty large steam-boilers, rated at over 2,500 horse-power, to run them. The machinery is practically the same in both countries, used in the same manner, and with the same efficiency.

In reply to your second and third questions, the organization and the methods possessed in the employment of labor are similar in both of our establishments.

In reply to your fourth question, where I state that the great bulk of our operatives

in the United States are Irish and French-Canadian, while in Paisley they are Scotch, with a sprinkling of Irish. You cannot consider the physical and intellectual ability of the former superior to that of the latter. Certainly I do not.

In order to give you a more correct idea of the difference of the wages paid in the two countries, I took a fortnightly pay-roll during the month of December last in Paisley, divided it by the number of operatives employed, I found the average was £1 4*s*. 11½*d*. sterling at 4.86, (exchange=$6.07), or $3.03½ per week. I then treated the last full pay-roll of 1881 (November) in the United States in the same manner, and the result, after deducting the necessary amount for the difference of time run, was $25.53, or an average of $6.38 per week. This shows conclusively that the wages we pay in the United States average 110 per cent. higher than those we pay in Scotland for identically the same class of work, the quality of work being similar.

The causes of this great difference in wages are the very high comparative rates paid for the female labor here, of which the great class of our employés is composed.

I am, very respectfully, yours,

JAS. COATS,
Of J. & P. Coats.

JOSEPH NIMMO, JR., ESQ.,
Chief of Bureau of Statistics, Washington, D. C.

[INCLOSURE F.]

WAGES OF LABOR IN THE MANUFACTURE OF THREAD.

[Letters of January 31, March 31, and April 3, 1882, addressed to the Chief of the Bureau of Statistics by the Clark Thread Company of Newark, N. J., and Paisley, Scotland.]

CLARK THREAD COMPANY,
Newark, N. J., January 31, 1882.

DEAR SIR: Your favor of yesterday is received.

In reply to your question as to what number of hours the employés work in either place, would say that in Paisley the factories work ten hours daily, five days in the week, and Saturdays to 12 o'clock noon, making a half holiday for Saturdays. In Newark we work ten and one-half hours, five days in the week, and stop on Saturdays at half-past one, making for Newark 59 hours as against 55 for Paisley.

With regard to your question as to the effectiveness of labor here and in Paisley, would say that my experience is about equal in both places, and the employés in either place, with the same machinery, will produce about the same amount of work, and they work as steadily in the one place as in the other. This idea of the superiority of American workmen over British, is humbug. It is used when a speaker wants to please an American audience, and generally has the effect he intends. But there is no doubt that both countries have their specialties in which they excel. Cotton spinning and cotton-spinning machinery is ahead in Great Britain, and most of our improvements come from there. Our business of making spool-cotton is only in process of development in this country, as there is still large quantities of six-cord imported, but is becoming less as we get our means of production extended.

Any further information I can give you, will be glad to do so; as I think it is best for you people to know the true inwardness of the business.

Yours, respecfully,

WILLIAM CLARK.

J. NIMMO, JR., Esq.

CLARK THREAD COMPANY,
Newark, N. J., March 31, 1882.

DEAR SIR: Yours of the 29th came duly to hand, and contents noted, and in reply

would answer the statements contained therein, as under, which we trust will be what you require to close up your report.

1. In regard to the machinery used in our two factories, would say that it is used in the same manner, but in a little larger extent in Paisley than in Newark.

2. The organization of labor is similar.

3. The methods pursued in the employment of labor is similar.

4. The physical and intellectual ability of the operatives in both countries are about equal.

5. The following is a statement of the wages paid in both countries to the same class of workers, and the percentage of one over the other:

	Paisley.	Newark.	Newark over Paisley.
GIRLS.			
	Per week.	*Per week.*	*Per cent.*
Spoolers	$3 60	$8 00	122
Reelers	3 60	8 00	122
Cop winders	3 60	8 00	122
Twisters	2 35	5 50	135
Slippers	1 65	3 00	81
Bobbin cleaners	1 50	2 50	66
MEN.			
Carpenters	7 25	17 00	135
Machinists	7 25	18 00	148
Dyers	7 00	15 00	114
Bleachers	6 50	13 50	108
Firemen	6 00	12 50	108

Hoping above will be satisfactory, we remain, yours, truly.

CLARK THREAD COMPANY,
Per CONTRELL.

JOSEPH NIMMO, Jr., Esq.

CLARK THREAD COMPANY,
Newark, N. J., April 3, 1882.

DEAR SIR: We did make an error in our estimate of March 31, having omitted to take the difference in time of working hours between the two countries, but having looked it over and made that correction, we find the following result, which we think correct: Girl's average Newark over Paisley, 99 per cent.; men's average Newark over Paisley, 104, per cent., or 101½ per cent. total average.

This is as near as we can get at it, and think you can safely take it as conclusive.

Yours, truly,

CLARK THREAD COMPANY,
Per CONTRELL.

JOSEPH NIMMO, Jr., Esq.,
Chief of Bureau.

[INCLOSURE G.]

A STATEMENT IN REGARD TO WAGES AND THE COST OF LIVING AT LANCASHIRE, ENGLAND, AND IN MASSACHUSETTS.

[By the Hon. Carroll D. Wright, Chief of the Bureau of Statistics of Labor of Massachusetts.]

In the following comparison as to wages and cost of living in England and Massachusetts, a family of two adults and three children in each country is supposed to

consume the same quantities of the same articles; that is, to be placed on equality as to scale of living, clothing and sundries not being included in either case. Each family is supposed to consist of a four loom cotton weaver, with wife and three children, two of the latter working in the mill. In neither case is the wife supposed to work. The English weaver is a Lancashire operative, working 56 hours per week, and his two working children are half-timers. The Massachusetts weaver works 60 hours per week, and his two working children are employed 32 weeks in the year. The wages of the English operatives are based upon the rates given in the report of Albert D. Shaw, United States consul at Manchester, England, transmitted December 1, 1881, to the Department of State. The wages of the Massachusetts operatives are based upon the average rates paid in that State, January 1, 1882; the weekly wages of the children being their average weekly wage for the entire year, that is, one fifty-second of their total yearly earnings.

The Massachusetts weaver earns per week	$5 64
Two children in weave-room each average per week, $2.33	4 66
Total income per week of the family	10 30
The Lancashire weaver earns per week	$5 28
Two children in weave-room, half-timers, each per week, 0.84	1 68
Total income per week of the family	6 96

Excess of weekly income in Massachusetts, $3.34.

Each family is supposed to consume the following, the same being the weekly subsistence of an English operative's family of the size under consideration, presented in the Progress of Manchester, by D. Chadwick, revised by Dr. Watts, and quoted by Leone Levi, in Work and Pay (London, 1877), p. 129. The English prices are based upon rates current in Lancashire from the report of Consul Shaw, before alluded to, December, 1881, and from other official sources. The Massachusetts prices are average rates current in said State January 1, 1882.

Articles and quantities consumed per week.	Cost at retail in Lancashire, England.	Cost at retail in Massachusetts.
Bread, 8 four-pound loaves	$1 20	$1 28
Corn meal, half peck	22	22
Flour, 6 pounds	26	27
Fresh meat, 5 pounds	95	80
Bacon, 2 pounds	36	40
Potatoes, 40 pounds	40	84
Milk, 7 quarts	42	42
Vegetables	12	12
Coffee, Java, half pound	16	16
Tea, quarter pound	12½	15
Sugar, 3 pounds	24	30
Rice, 2 pounds	08	20
Butter, 1 pound	30	35
Molasses, 1 quart	12	16
Soap, 1½ pounds	10	10
Coal	36	62½
Oil	12	10
Rent, five rooms	1 20	1 50
Totals per week	6 73½	7 99½

That is to say, it would cost the family in Lancashire to live, without sundries and clothing	$6 73½
While the family in Massachusetts consuming the same things and same quantities would expend	7 99½
Extra expense in Massachusetts per week	1 26

We have previously shown the excess of weekly income in Massachusetts to be $3.34, and, therefore, deducting therefrom the extra expense of living, there remains a net excess of income per week in favor of Massachusetts of $2.08. Out of the total weekly income the Lancashire family would have for sundries and clothing (after providing for the items of expenditure contained in the foregoing table) the sum of 22½ cents, while the Massachusetts family would have for the same purpose $2.30½.

It should be remembered that the items of subsistence quoted are those actually consumed by a Lancashire family of the size named, and, in the comparison, the Massachusetts family is supposed to consume precisely the same articles and quantities, no allowance being made for any change in the style of living. It will be seen that the wages of the children vary more than those of the adults, and that this variation, being in favor of Massachusetts, is an important element in producing the excess of weekly income shown in that State. The wages of the children should, however, be included in the earnings of each family, as these wages are the saving factors of the income product both here and in Lancashire, it being nearly impossible to support a family containing more than three members in either locality from the earnings, in this industry, of the father only. Should the wife work in the mill, and her earnings enter into the comparison, the relative position of the families as to excess of income would not be materially changed, as the wages of adult females in the two countries do not vary more than those of adult males.

We also present a comparison between the condition of a Blackburn cotton-spinner and that of a Massachusetts cotton-spinner, prepared in the same manner and on the same basis as that taken for the weavers:

The Massachusetts mule-spinner earns per week	$10 09
Two children, frame-tenders, average per week $1.85	3 70
Total income per week of the family	13 79
The Blackburn mule-spinner averages per week	$7 80
Two children, little tenders, half time each, per week, $0.96	1 92
Total income per week of the family	9 72

Excess of weekly income in Massachusetts, $4.07.

Net excess after deducting $1.26, the extra weekly expenditure of the family in Massachusetts, $2.81. The family of the Blackburn spinner would have for sundries and clothing, after providing for the items specified in previous table, $2.98½, while the Massachusetts family would have for the same purpose, $5.79½.

[INCLOSURE H.]

WAGES IN THE MANUFACTURE OF COTTON GOODS.

[A letter addressed to the Chief of the Bureau of Statistics by Edward Atkinson, esq., of Boston, Mass.]

BOSTON, *January* 18, 1882.

DEAR SIR: Your letter of January 16 is at hand, asking me for recent data respecting the rates of wages in the manufacture of cotton goods in the United States, Great

Britain, Germany, and France. I am unable to give you this information, but have sent your letter to Mr. Carroll D. Wright, of our bureau of statistics, who may be able to give you the information you ask for.

I beg to say that I personally take very little interest in collating the wages of workmen employed in different countries in special industries to which machinery is largely applied, for the reason that, in my judgment, there is no standard of the cost of production of any given fabric so utterly fallacious as the comparison of the rates of wages paid. So far as the rate of wages, however, constitutes in part a standard of cost, it is tolerably safe to take the *highest* wages as the standard of *lowest* cost. This rule would be nearly an absolute one if there were no special obstructions to commerce between the different States in which the work is done, such as distance, heavy grades, &c.

The reason is obvious; the total cost of production of any given fabric, say cotton goods for instance, consists of—

1st. The cost of cotton.

2d. Fuel, dye-stuffs, supplies, and other materials.

3d. Insurance, taxes, and general expenses.

4th. Wages.

It therefore follows that if climate and other conditions are favorable, the place in which what are called the raw materials can be had to the best advantage may be the place in which the highest wages can be paid, and yet the cost of production be the least. By raw materials in this case would be meant cotton, coal, oil, starch, fuel, iron, and steel, used in the factory and the subsistence of the operatives employed therein. Further, the effect of heavy taxation, especially where the taxes are expended in keeping a very large portion of the working people in compulsory idleness, as in standing armies, will form a very important element in the cost of all production, and a nation which is free, especially from the burden of a standing army, can afford higher wages in industrial pursuits than one which is subject to it.

Further, the use of machinery, and the cost of the production of such machinery depends upon the intelligence, manual skill, and physical ability of the operative who directs it. Most of the work being done by the piece, the operative who earns the highest wages working on piece work, produces cloth at the lowest cost.

When all these elements are taken into consideration, I think it follows that any one who attempts to gauge the cost of production by comparison of wages, will most likely be misled; and if it is assumed that the lowest cost of production will be found where the wages are lowest, he will be sure to be misled, as that rule would lead to the expectation of finding the lowest cost of cotton fabrics in the factories of India; next in the factories of Germany; next, perhaps of France, and last, perhaps of England; the upward sequence of wages being substantially according to the order named.

Such an inference would be absolutely false, as the cost of production in these four instances is, in point of fact, in the reverse order and inverse ratio to the wages paid.

Very respectfully, your obedient servant,

EDWARD ATKINSON.

JOSEPH NIMMO, Jr., Esq.

P. S.—We have about 175,000 persons in our cotton factories, of whom about 160,000 work for the home market. By comparing the product of the hand-carders, spinners, and weavers, who were at Atlanta, I gauged their capacity, and I found that if we still depended on that method, about sixteen million of our population would be needed to make our present supply in place of 160,000 now at work.

The capacity of an operative directing our modern automatic machinery being one hundred fold that of an operative working the hand-card, wheel, and hand-loom. Assuming that our adult factory operatives earn about one dollar a day each, it follows that the successful competitor on hand-worked machinery would need to work at one cent a day in order to compete.

Apply this rule to the Chinese, the largest body of people using cotton in the world-and mostly clothed by hand-made goods. It will be apparent that it would be fallacious to compete or to infer a low cost of manufacture because Chinese wages are low. If we then take the two extremes of the operatives working by hand on machinery in China, and the operative directing modern machinery in Lowell, we find that in Lowell where the high relative wages are paid, the low relative cost is to be found.

Hence follows this rule: *Other things being equal, high wages coupled with low cost are the necessary result of the most intelligent application of machinery to the arts, provided the education of the operative keeps pace with the improvement of the machinery.*

This fundamental principle must be comprehended in order that any valuable deductions may be made from wages, and before the true cost of any fabric can be determined, the *other things* which are not equal must be ascertained.

E. A.

[INCLOSURE I.]

WAGES AND THE COST OF LIVING OF PERSONS EMPLOYED IN THE MANUFACTURE OF COTTON GOODS.

[A letter addressed to the Chief of the Bureau of Statistics by Hon. Jonathan Chace, member of Congress from Rhode Island.]

HOUSE OF REPRESENTATIVES,
Washington, D. C., 4, 13, 1882.

RESP'T FRIEND: I have been absent in New England for a week, and on my return to-day find thy letter of the 11th inclosing the article from the pen of Carroll D. Wright and asking my views upon it, and upon other statements to which you call my attention.

Now, this case clearly illustrates the danger of falling into error whenever the statistician attempts to make averages.

Carroll D. Wright is undoubtedly a careful man, and thinks himself right. Any person except those who understand the business of manufacturing, practically, would say that, with his means of information, his figures must be entirely trustworthy, and yet, *every practical manufacturer knows they are incorrect.* Here are two establishments, the Coates' and Clark's, each having mills in this country and in Scotland. They keep their books in the most careful and accurate manner. *They pay out the money* and charge it to the persons earning it. Every reasonable man will, I think, admit that they *know absolutely* what the facts are. They are gentlemen of the highest character for integrity. Now, who is Albert D. Shaw? He is our consul at Manchester. He probably has no practical knowledge whatever *about the business*, but he takes such statements as he has been able to gather up, and then attempts to make *an average* from such data. Which is the most valuable testimony? I have no trouble in deciding, for I unhesitatingly take the testimony of Coates and Clark in preference to that of Shaw and Wright. If our consul had gone to a large number of mills and ascertained the price they pay for weaving (remember, it is almost entirely "piece-work"), he might have gotten the lowest and highest prices. That would have been a comparatively easy and simple thing to do, because, in Great Britain, there has grown up a system of price-tables, which are used by the mill-owners and operatives in settling their differences.

Now, as to the accuracy of Wright's statement of the earnings of weavers in Massachusetts. It is a well-known fact that the weavers in a cotton mill are among the highest paid of the operatives. He says they earn in Massachusetts only $5.64 per week.

I have in my table reports from three mills in that State, which I think are a fair representative average of the Massachusetts mills.

This table gives not the average pay of *weavers* or of all the *men* employed, but the average pay of *men, women, and children.*

EMPLOYÉS.

	Men.	Women.	Children.*	Total.	Average pay per week.
	No.	*No.*	*No.*	*No.*	
A.—First-class mill	203	231	37	471	$7 40
B.—Medium mill	129	137	34	300	7 18
C.—Medium mill	128	212	21	361	6 60

*Children are under fifteen years of age.

This table shows that the average wages earned in these three mills by *men, women, and children* were $7.06 per week as against Wright's statement of $5.64 per week for weavers. In other words, the average wages in these three mills are 25 per cent. more than Wright states for *weavers*, who are among the highest paid of the operatives.

Now let us see what Edward Atkinson says in reply to a letter I wrote to him. He is a special agent of the census. He says, in his report, that "in New England the average earnings of each operative, working 300 days in a year, in the census year, was a fraction less than 86 cents per day; they are now higher." That amounts to an average of $5.16 per week for *men*, *women*, and *children*. He says further on in his report, that in the cotton mills of the whole country there were employed 59,142 men, 14,942 boys, 83,115 women, and 12,960 girls. Now, with these figures before us, and, when we remember that a large proportion of the weavers are *men* who could earn in a great number of common laboring occupations requiring no skill or previous training, more than $1 per diem or $6 a week, we are forced, I think, to give credit to Coates and Clark, and to discredit Wright and Shaw.

Bear in mind that weavers are among the highest paid operatives in a cotton mill.

As to *the cost of living*. Wright says *bread is cheaper* in England than in Massachusetts, while millions of dollars' worth of breadstuffs are exported every year from Boston to Liverpool.

The price of corn meal he states to be the same in the two countries, and bacon 10 per cent. cheaper in England. But this statement is absurd on its face; for how could we have exported to Great Britain last year breadstuffs and provisions to the value of $247,000,000, under such conditions as to prices in the two countries? Butter, he quotes at 30 cents in England and 35 cents *in Massachusetts*. And yet every year we export millions of pounds of butter to Great Britain. Then, again, look at the comparative expense on account of oil. That, of course, means illuminating oil, of which we exported last year about 400,000,000 gallons.

Now, Nimmo, does thee believe those figures of Shaw and Wright are correct? The facts above stated, in my opinion, effectually dispose of their statements. But thee has in thy own office a very large amount of evidence proving conclusively the entire fallacy of the whole thing.

Two years ago the wages of cotton operatives, in this country, averaged more than 60 per cent. higher than in England.

Now, let us apply one more test. If our operatives are no better off, why do so many come here from Great Britain, and why do none of them return?

I estimate that the general average of *weekly earnings* of all cotton mill operatives in the United States is about 62 per cent. greater than in England. The earnings of weavers and of the other more highly skilled and better paid laborers in the United States exceeds the earnings of such laborers in England in a much greater degree.

I have not answered thy previous letter for want of time.

This subject might be elaborated still more, but I trust the above is conclusive.

Very respectfully, &c.,

J. CHACE.

JOSEPH NIMMO, JR.,
Chief Bureau of Statistics.

[ENCLOSURE J.]

WAGES PAID IN THE MANUFACTURES OF LEATHER.

[A letter addressed to the Chief of the Bureau of Statistics by the *New York Shoe and Leather Reporter.*]

SHOE AND LEATHER REPORTER,
New York, January 21, 1882.

DEAR SIR: Your inquiries, dated January 16, to hand.

In the United States, Great Britain, France, and Germany the work of currying or finishing leather is done by the piece. The tanners work by the day or week. In the manufacture of patent and enameled leather in Newark, N. J., the tanners are paid $12 a week; the finishers average $15 a week. Almost all the leather of that class, made in this country, comes from Newark.

For morocco leather, wages of tanners in New York and Philadelphia, are $12; in Wilmington and Lynn, $10 a week. Morocco finishers by machinery, New York and Philadelphia, $13 to $14, and in Lynn and Wilmington, $11 to $12 a week. Nearly all the morocco of domestic manufacture is made in the four cities mentioned. In upper leather and calf-skin manufacture, tanners, in Eastern and Western cities get $10 to $11, and curriers $14 to $15 a week. In the country towns wages rule $2 to $3 a week less than in cities. Sole leather is mostly tanned in the midst of bark forests, where living is cheap and the requirements of the laborers are few. The wages paid in such places all over the United States is about $1.25 a day for tanners, and for finishers or skilled workmen $1.50 to $1.60 a day.

Sole-leather tanners, in Philadelphia and Baltimore, Louisville, Cincinnati, and Chicago, get $9 to $10.50 a week. Ten hours is a day's labor.

In Great Britain nine hours is a day's labor. In London tanners get equal to $8.50 to $9.50 a week; curriers, $10 to $13 a week. In the Provinces and Scotland tanners make $6; finishers, $7 to $7.50 a week. In Leeds, where a great many East India tanned skins are finished, the curriers make $6.50 to $7.50 a week.

In Germany tanners get 80 cents to $1, and curriers make $1 to $1.15 a day. This is the rate of wages throughout the empire, and ten hours is a day's work.

In the provinces of France the wages of tanners and curriers average $5.00 to $5.50 a week. Tanners in Paris get $1 a day; curriers average to make $9 a week.

Yours, respectfully,

N.
For Shoe and Leather Reporter.

HON. JOSEPH NIMMO, Jr.,
Washington, D. C.

The undersigned hereby confirm the within statements as being substantially correct:

THOMAS E. PROCTOR.
HERSEY, WASHBURN & CO.
JOHN CUMMINGS.
L. B. HARRINGTON.
F. SHAW & BROS.
HENRY POOR & SON.
JAS. A. & GEO. F. ROBERTS.
N. W. RICE & CO.
ALLEN, FIELD & LAWRENCE.
DAY, WILCOX & CO.
A. B. MARTIN & CO.
JOHN B. ALLEY & CO.

Abstract of data furnished in the foregoing letter.

UPPER LEATHER AND CALF-SKIN MANUFACTURE.

Tanners' wages.—Eastern and Western cities of the United States, $10 to $11 per week.

Curriers' wages.—Eastern and Western cities of the United States, $14 to $15 per week. In country towns of the United States, $2 to $3 a week less.

Morocco leather-tanners' wages.—New York, $12 a week; Philadelphia, $12 a week; Wilmington, Del., $10 a week; Lynn, Mass., $10 a week.

MOROCCO FINISHING BY MACHINERY.

Wages of finishers.—New York, $13 to $14 per week; Philadelphia, $13 to $14 per week; Lynn, Mass., $11 to $12 per week.

SOLE LEATHER TANNERS.

In the country towns of the United States, $1.25 per day.

In Philadelphia, Baltimore, Louisville, Cincinnati, and Chicago, $9 to $10.50 per week. Ten hours a day.

In London, England, $8.50 to $9.50 per week. Nine hours a day's work.

In the country towns of England, and in Scotland, $6 a week. Nine hours a day's work.

In Germany, 80 cents to $1 a day. Ten hours a day's work.

In French provinces, $5.00 to $5.50 a week.

In Paris (France), $1 a day.

SOLE-LEATHER CURRIERS—WAGES OF.

In country towns of the United States, $1.50 to $1.60 a day. Ten hours a day.
In London, England, $10 to $13 a week. Nine hours a day.
In the country towns of England and in Scotland, $7 to $7.50 a week.
In Leeds, England, East India tanned skins, $6.50 to $7.50 a week.
In Germany, $1 to $1.15 a day. Ten hours a day.
In the provinces of France, $5.00 to $6.00 a week.
In Paris, $9.00 a week.

NEW YORK CITY, *May* 17, 1882.

DEAR SIR: We estimate that tanners receive 13⅓ per cent. more in the United States than in Great Britain, 54½ per cent. more than in France, and 57½ per cent. more than in Germany, and that curriers receive 35⅐ per cent. more in the United States than in Great Britain 66⅔ per cent. more than in France, and 93¾ per cent. more than in Germany.

Very respectfully yours,

SHOE AND LEATHER REPORTER.

Mr. JOSEPH NIMMO, JR.,
Chief of Bureau of Statistics, Treasury Department, Washington, D. C.

[INCLOSURE K.]

WAGES, AND THE CONDITIONS UNDER WHICH THE MANUFACTURE OF SILK GOODS IS CARRIED ON IN DIFFERENT COUNTRIES.

[Statements submitted by Wm. C. Wyckoff, esq., secretary of the Silk Association of America.]

NEW YORK, *April* 27, 1882.

DEAR SIR: In compliance with your request, I have sent you a statement showing rates of wages paid to specified operatives in silk manufacture in the United States,

and details of similar kind, so far as I have been able to obtain them at date of present writing, for similar classes of operatives in Europe.

There are differences between the methods of manufacture here and in Europe which render estimates of the kind required somewhat difficult. The differences extend to the modes of employment of the workmen, and to their designation as operatives of a specified class. A large proportion of the work in Europe is performed at the homes of the workmen, which here is performed in the mill. The family of an operative in Europe assist him in the work done at his home, but do not receive separate wages as they do here where they are directly employed. Consequently a family as a unit earns a great deal more here than abroad. The system of penalties in the form of deductions from wages for imperfect work is more severe in Europe than here. Steam-driven machinery is more used here than abroad for many of the processes of manufacture. It should be said, however, that what may be called American methods of manufacture have been latterly introduced into Europe; and on the other hand certain features of what might be called European methods have been to some extent adopted here.

From the best information I have been able to obtain, I regard it as entirely within bounds to state that there is paid for similar labor in silk manufacture in this country twice as high wages as in England, approximately three times as high as in Germany and France, and four times as high as in Italy.

Yours, respectfully,

WILLIAM C. WYCKOFF,
Secretary.

Hon. JOSEPH NIMMO, JR.,
Chief of Bureau of Statistics, Washington, D. C.

Rates of wages in silk manufacture per week, in dollars.

Designation of operative.	Sex.	Average per United States census 1879—1880.	Recent in United States (1882).	Estimated average in England.	Estimated average in Germany.	Estimated average in France.	Estimated average in Italy.
Hard silk winder *	F.	$5 25	.....	$2 96	.....	$1 40	.....
Hard silk doubler	F.	5 18	.....	.....	.....	2 45	.....
Hard silk spinner	M.	5 57	.....	.....	.....	.....	$2 10
Do	F.	4 87	$5 00	.....	.....	2 00	1 44
Hard silk twister	M.	5 98	.....	.....	.....	3 42	.....
Do	F.	5 67	.....	.....	.....	2 10	.....
Soft silk winder	F.	6 35	8 00	.....	.....	2 00	.....
Warper	M.	10 71	.....	.....	.....	.....	.....
Do	F.	7 62	10 00	.....	.....	2 40	.....
Beamer †	M.	12 11	.....	.....	.....	.....	.....
Do †	F.	7 72	.....	.....	.....	.....	.....
Warp twister	M.	13 96	.....	.....	.....	.....	.....
Weaver on hand-looms ‡	M.	14 15	.....	.....	$3 93	5 40	4 80
Do	F.	8 44	.....	.....	2 72	3 00	2 28
Weaver on power-looms	M.	11 43	.....	5 40	3 00	.....	.....
Do	F.	7 94	.....	4 38	.....	.....	.....
Weaver of plain common ribbons	.....	.....	.....	.....	.....	2 70	.....
Weaver of better grade ribbons	.....	.....	.....	.....	.....	3 90	.....
Weaver of fancy ribbons	.....	.....	.....	.....	.....	5 10	.....
Weaver of best novelty ribbons	.....	.....	15 00	.....	.....	9 60	.....
Weaver of damasks	M.	.....	.....	.....	3 93	.....	.....
Weaver of dress-goods	M.	.....	12 00	.....	2 73	6 00	.....
Do	F.	.....	9 00	.....	1 66	.....	.....
Weaver of plush, &c	M.	.....	.....	.....	4 07	.....	.....
Do	F.	.....	.....	.....	2 76	.....	.....
Loom-fixer †	M.	15 87	.....	.....	.....	.....	.....
Finisher †	M.	13 50	.....	.....	.....	.....	.....
Designer	M.	24 71	.....	12 00	.....	.....	.....
Lace operative (machine)	M.	14 75	15 00	9 11	.....	.....	.....
Do	F.	5 00	.....	3 00	1 00	3 60	.....
Braid operative (machine) §	M.	16 00	.....	.....	7 90	.....	.....
Braider §	F.	5 41	.....	.....	2 32	.....	.....
Fringe-maker	F.	5 30	.....	.....	1 43	.....	.....
Dyer	M.	12 77	.....	7 00	.....	.....	3 30

* Lower figures are given for wages of children in England.

† Not separately employed under such designations in Europe.

‡ Hand-looms are more used than power-looms in Europe; the reverse is true here. Statistics from Europe do not distinguish the two classes.

§ Systems of employment here and in Europe differ materially.

[Extract from "The Silk Goods of America," by Wm. C. Wyckoff, secretary of the Silk Association of America.]

The system of manufacture in Europe is entirely different from that which has grown up in this country. Judged from our point of view the European manufacturer seems rather to be a mere contractor. He buys tram and organzine, *i. e.*, filling and warp which have been made at a separate factory. He sends this material to another establishment, a dye house. Finally he puts it out to weavers who have looms at their own homes. He has no factory and no machinery. Under such circumstances it is not surprising that there is little improvement in machinery and methods from year to year. Our manufacturers have been obliged, on the contrary, to concentrate the work, so as to keep every portion of it under direct supervision. In several of our larger silk mills all the different processes referred to are conducted beneath a single roof, so that the raw silk becomes finished goods under the eye of the manufacturer. In some instances these mills have within their walls, rooms provided with all tools and machinery for their own repairing and carpentering work; a few make nearly all their own machines. There is a marked disposition to try improvements in this country, and it is the general experience that the very-best machinery, though at first far more costly, is in the end decidedly the cheapest.

The European manufacturer derives certain advantages from his system. A considerable part of his product is made to order, thus relieving him of the risk of originating goods of new designs which may or may not find favor in the market. He is not obliged to start with a great outlay for mill and machinery; this leaves him free to employ his capital in purchasing yarns, and he usually buys and stores in his warehouse enough to supply his weavers during an entire season. It seems evident, however, that the division of the processes between three or four separate establishments, throwsters, dyers, weavers, and probably, finishers, must imply an added cost in a profit to each. The American system is largely a consequence of substituting machinery for manual labor. The work of the power-loom is definite and positive; it is not liable to defects such as happen to hand-made goods if the weaver's hand is unsteady in throwing the shuttle, or if he is careless in using the number of picks required by the pattern. Of course such defects can be to a great extent avoided by a very careful inspection of the fabric as it comes from the weaver's hands; but there is certainly room for the belief of our manufacturers that the power-loom goods are more serviceable to consumers, because more uniform, and therefore more durable. Many minor improvements in the machinery have also contributed to this result within a very few years.

[Inclosure L.]

REGULATIONS ENFORCED BY MANUFACTURING ESTABLISHMENTS IN MASSACHUSETTS, IN REGARD TO THE BOARDING OF OPERATIVES AND THE CONDUCT OF TENEMENT HOUSES.

[Statements furnished by Hon. Carroll D. Wright, chief of the Massachusetts bureau of statistics of labor.]

Boston, *April* 27, 1882.

Dear Sir: Your favor of 25th at hand. As far as our knowledge extends, the boarding of operatives in corporation houses is more general in Lowell and Lawrence, in this State, than anywhere else in New England, and even there the tenement house is fast supplanting them. The opinion has been universal that the factory operatives of Lowell were mostly in the corporation boarding houses, but p. 292 of our report for 1882, shows that in 1875 the majority were "at home," and the tendency to the home, or tenement house, is yearly increasing. In our report for 1882, you will find information concerning regulations in boarding houses in Lowell and Lawrence, pp. 282–292;

concerning food, on p. 295, and, on p. 331, a reference to the plan adopted in Lowell by which the mill-owners allow 5 cents a day towards the board of each female operative who is actually at work. We also send you sample copies of boarding-house regulations in Lowell and Lawrence.

We trust the above will answer your inquiries, and shall always be pleased to supply you with all information in our power.

Very respectfully, yours,

CARROLL D. WRIGHT, *Chief.*

Hon. JOSEPH NIMMO, Jr.,
Chief Bureau of Statistics, Washington, D. C.

A.

THE —— COMPANY —— BOARDING-HOUSE REGULATIONS.

The tenements of this corporation are expressly for the accommodation of persons in its employ.

They are not to be underlet by the tenant of the company, nor are any persons not employed on the corporation to board in them, except by special permission. And males and females will not be allowed to board in the same house, except by permission given in writing by the agent.

The tenants are required to have all parts of their houses daily ventilated, and together with the yard, kept clean, and in good order; they are not to allow any water, or filth, to be thrown out in front of them, or to be kept in the cellar, or ashes to be kept in wooden vessels.

No nails must be driven into any part of the plastering or wood-work of the building, and should the premises be injured beyond the ordinary use and wear, the injury will be repaired, and the cost charged to the person leasing the house.

The doors are to be closed at 10 o'clock in the evening. Rude or disorderly conduct must at no time be permitted; and the tenant will be held answerable for any such from visitors allowed to remain after the time for closing the doors.

No camphene or similar compound used for lights will be allowed in the building.

Window glass, when broken, must be re-set within one day.

If it shall be known to a tenant that any article belonging to the company has been improperly taken from the mill, they are required to give immediate notice of the same at the counting-room.

It will be strictly required that all who live in the houses shall be vaccinated, which may be done by a physician employed by, and at the expense of the company A suitable chamber for the sick must be reserved in each house. If any contagious disease is suspected, notice must be at once sent to the counting-room.

The tenants will, when required by the agent, give to him in writing, so far as is within their knowledge, a correct account of the number, names, character, habits, and occupation of their boarders. They must send to the counting-room on the first Monday of every month a list of all the boarders they have taken, and of all who have left their houses during the preceding month, and must not discharge any boarder without first giving notice to the agent of their intention. If any person leave for the purpose of boarding off the corporation they must give immediate notice at the counting-room.

The tenements will be inspected once a month by the agent, to see that everything is kept in proper order, and satisfactorily to the corporation.

It is expected that all children, between the ages of 12 and 14, living in the company's houses, will be kept constantly at school.

Conformity to these regulations will be strictly exacted, and tenants held answerable for their observance on the part of their boarders.

———— ————,
AGENT.

B.

THE FOLLOWING ARE AMONG THE REGULATIONS TO BE OBSERVED BY PERSONS OCCUPYING THE HOUSES AND TENEMENTS BELONGING TO THE ——-—— MANUFACTURING COMPANY.

The buildings, both inside and out, and the yards about them, must be kept clean and in good order.

If the buildings or fences are injured, they will be repaired at the expense of the tenant.

No one will be allowed to keep swine or hens.

Ashes, broken crockery, or similar substances, must not be deposited in the privy vaults.

Tenants must remove the snow from the sidewalks in front of their tenements as soon as possible after it stops snowing, and ice as soon as possible after it is formed, or cover it with sand or ashes.

Tenants giving up their leases must return or pay for all missing keys.

Tenants must not put on locks or make changes or additions to tenements, without special permission.

Tenants of houses not designed as boarding-houses must not take boarders.

Boarding-house keepers, unless by special permission, must not take as boarders persons not in the service of the company; nor board males and females in the same house.

They must allow no disorderly or improper conduct in the houses.

They must report at the counting-room all cases of sickness as soon as it becomes necessary to call in a physician, and all cases of contagious or infectious diseases as soon as known to or suspected by them.

They must close their doors at 10 o'clock p. m., and must not allow, without good reason, any person to be admitted after that time.

When required, they must give an account of the number, names, and employment of their boarders, of their general conduct, and whether they attend church habitually or not.

[INCLOSURE M.]

[Supplemental statement by Joseph D. Weeks.]

PITTSBURGH, PA., *May* 22, 1882.

DEAR SIR:

* * * * * * *

I do not mean to say that, man for man, naturally the American workingman in the iron mills is better than the Englishman. I simply mean to say that he is willing to work more and harder, and consequently turns out a great deal more product.

For example, a case in question has just come to my notice. The iron workers in the north of England have just made a demand for 7½ per cent. advance, and for what they term "prize money," this prize money being what we would call extra for over time and holidays, or an extra price paid for working at unusual times, as night or Sunday. Now, they claim that Monday should be regarded as a holiday, and refuse to work Monday unless they are paid an extra price for doing so. If they should work Monday they would probably turn out as much as any other day; but by their system of working, Monday being regarded as a holiday and Saturday as a half-holiday, they lose more time than the American does; consequently their effectiveness is less. It does not affect the general statement, however, if the word "effectiveness" is properly construed.

We also say "while wages per ton in many cases are nearly the same the earnings per diem are fully twice as much" with the same consideration that this does not mean

a day that an American would work as hard as he could, but per day for a number of consecutive days, say for six months. There is no trouble about that statement either.

* * * * * * *

Yours, respectfully,

JOSEPH D. WEEKS.

JOSEPH NIMMO, JR., Esq.,
Chief of Bureau of Statistics, Washington, D. C.

47TH CONGRESS, 1st Session. } SENATE. { Ex. Doc. No. 174.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

A communication from the Secretary of the Interior, inclosing a copy of a letter from the governor of Arizona, requesting an appropriation of $2,000 for the contingent expenses of the Territory for the next fiscal year.

MAY 11, 1882.—Read and referred to the Committee on Appropriations and ordered to be printed.

To the Senate and House of Representatives:

I submit herewith, for the consideration of Congress, a letter from the Secretary of the Interior, inclosing a copy of a letter from the governor of Arizona, in which he requests that an appropriation of $2,000 be made for the contingent expenses of the Territory for the next fiscal year.

CHESTER A. ARTHUR.

EXECUTIVE MANSION,
May 11, 1882.

DEPARTMENT OF THE INTERIOR,
Washington, May 8, 1882.

SIR: I have the honor to inclose a copy of a letter from the Hon. Frederick A. Tritle, governor of Arizona Territory, in which he requests an appropriation of $2,000 for the contingent expenses of the Territory for the next fiscal year, and to suggest that the matter be submitted to Congress.

Very respectfully,

H. M. TELLER,
Secretary.

The PRESIDENT.

EXECUTIVE DEPARTMENT, TERRITORY OF ARIZONA,
Tucson, April 20, 1882.

DEAR SIR: As governor of this Territory I have only a contingent fund of $500 allowed by Congress. It should be at least $2,000, as no

provision has been made by the Territory for office rent, or private secretary. If consistent with your experience of Territorial expenses, please ask for an increase of my contingent fund for the coming year.

* * * * * * *

I am, most respectfully, your obedient servant,

F. A. TRITLE,
Governor.

Hon. HENRY M. TELLER,
Secretary of the Interior.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 175.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

A report of the Secretary of State, with accompanying papers, submitted in response to Senate resolution of the 21st of March last, requesting a copy of instructions given Mr. George F. Seward, when minister to China, concerning Chinese immigration, &c., and dispatches on that subject, &c.

MAY 15, 1882.—Ordered to lie on the table and be printed.

To the Senate of the United States:

I transmit herewith a report of the Secretary of State, with accompanying papers, submitted in response to the Senate resolution of the 21st of March last, requesting a copy of instructions given to Mr. George F. Seward, when minister to China, concerning Chinese immigration, &c., and Mr. Seward's dispatches on that subject.

CHESTER A. ARTHUR.

EXECUTIVE MANSION,
Washington, May 15, 1882.

To the PRESIDENT:

The Secretary of State, to whom was referred the Senate resolution of the 21st of March last, requesting the President, if in his judgment not incompatible with the public interest, to communicate to the Senate the instructions given to Mr. George F. Seward when minister to China, concerning Chinese immigration and a modification of existing treaties relating thereto, and all correspondence between Mr. Seward and the Department of State relating to said subject, has the honor to submit herewith the papers mentioned in the accompanying list.

FRED'K T. FRELINGHUYSEN.

DEPARTMENT OF STATE,
Washington, May 15, 1882.

LIST OF ACCOMPANIMENTS.

No. 1.—Mr. Seward to Mr. Evarts (No. 425), March 22, 1878.
No. 2.—Mr. Evarts to Mr. Seward (No. 296), April 23, 1879.
No. 3.—Mr. Seward to Mr. Evarts (No. 450), July 7, 1879.
No. 4.—Mr. Seward to Mr. Evarts (No. 457), July 21, 1879.
No. 5.—Mr. Seward to Mr. Evarts (No. 467), August 1, 1879, with inclosures.
No. 6.—Mr. Seward to Mr. Evarts (No. 472), September 9, 1879, with inclosure.
No. 7.—Mr. Seward to Mr. Evarts (No. 515), November 26, 1879, with inclosure.
No. 8.—Mr. Seward to Mr. Evarts (No. 614), March 1, 1880.
No. 9.—Mr. Seward to Mr. Evarts (No. 636), March 20, 1880, with inclosures.
No. 10.—Mr. Seward to Mr. Evarts (No. 649), March 31, 1880, with inclosure.
No. 11.—Mr. Seward to Mr. Evarts (No. 647), May 1, 1880, with inclosure.
No. 12.—Mr. Seward to Mr. Evarts (No. 735), July 24, 1880, with inclosure.

No. 1.

Mr. Seward to Mr. Evarts.

No. 425.] UNITED STATES LEGATION,
Peking, March 22, 1878. (Received May 16.)

SIR: It is evident that the presence of Chinese in our Pacific States is giving rise to much anxiety there, and that the questions involved are becoming national. It is almost equally clear that it is still too early to say what conclusions will be reached by the country.

It is not my part to express an opinion as to what those conclusions should be. It may be appropriate, nevertheless, for me to state certain considerations, which, in my judgment, should not be lost sight of.

The proposition has been advanced that it is competent for Congress to abrogate by legislation those parts of our treaties with this empire which provide that Chinese may resort to the United States and enjoy there the privileges accorded to subjects of the most favored nation.

Without raising a question as to the merit of this proposition, I may present for your consideration the fact that it may be inexpedient to proceed in this way. I take it for granted that we would not do this in any case, excepting as a last resort. There are reasons, however, why we should be more careful to avoid such a course, where our relations rest upon the basis of treaties wrested from the other party by the exercise or display of force, and from which they would gladly withdraw, if allowed to do so.

It is true that our own treaties were procured in the ordinary course of peaceful diplomatic negotiations, but it is well known that those negotiations became possible only because other powers had been in the field with fleets and armies. It is equally well known that many occasions have arisen in the course of the foreign relations of the empire when very earnest language has been used to her, and she has been made to feel the danger of disregarding the rights and privileges secured to foreigners under the treaties.

Would it not be unwise, then, for us to set China the example of an arbitrary and willful violation or abrogation of the treaties, or any part of them?

Would it not, indeed, imperil all our relations with the empire and afford a certain ground of reproach against us by China and by all the powers which are interested here?

On the other hand, we are not, as I judge, in position to undertake negotiations for the abrogation of existing treaty stipulations and for the substitution of others intended to define the lines within which the immigration of Chinese into the United States may be permitted. As I have said, the country has not yet passed upon the question whether we ought to disavow, to use the language of one of our treaties, "the inherent and inalienable right of man to change his home and allegiance, and the advantages of free migrations." The most which can be said is that it may be desirable to secure such a revision of our treaties as will leave us free to deal with the question of Chinese immigration in the ordinary course of legislation.

With the question whether it is expedient to attempt this even, I shall not concern myself. If we do, we may subject ourselves to criticism, indeed, but we shall proceed in an honorable way, and with a right regard to the sanctity of existing treaty stipulations, and of our responsibilities in this respect to the people of our own and of all other countries. It is appropriate, however, that I should express an opinion whether such a negotiation could be expected to succeed.

From the diplomatic point of view we have always been at a disadvantage in dealing with China.

We have voluntarily accorded to her people within our borders the privileges of those of the most favored nations. China, however, has yielded only a few privileges to our people, and we are constantly obliged to resort to diplomatic representations to secure to them the enjoyment of even these. As a consequence, we are always asking something from China, while she has nothing to ask from us. If, however, it has now become an object for her to secure for her people in our country the privileges so freely accorded to them, the situation has changed, and may be taken advantage of in all future negotiations.

A very few words are needed to indicate the lack of reciprocity between us. I think that there are no opportunities of residence, or of enterprise, from which the Chinese among us are debarred. They can go where they will, and do what they will, in all our broad domain. But it is not so here. Our countrymen may reside in a few cities only, and they may engage in no enterprises outside of the ordinary interchange of commodities and their transportation between defined points. Opportunities exist to develop mines, to establish furnaces and factories, to construct roads, canals, railroads, and telegraphs, to operate these, and steam or other vessels, on many routes not now open to them; but from all these, and many other important branches of enterprise, we are effectually, and perhaps hopelessly, shut out.

Perhaps, then, the time has arrived when we may say to this government that we expect a more perfect reciprocity, and that if our people cannot be admitted here to all the privileges enjoyed by theirs in our country, they must not blame us if we demand such a revision of our treaties as will leave us free to meet the necessities of our situation.

It is very certain that China would not consent to the extension of the privileges enjoyed by foreigners in this country, and it is possible that, rather than do this, she would agree to such a revision of our treaties as I have indicated.

But if she should not do so, and should plant herself firmly on existing treaties, refusing to grant to us anything, or to assent to the withdrawal of any privileges from her people, we would have proceeded, nevertheless, as I have said, in an honorable way, and could then consider the whole situation and determine the policy which would most conduce to our welfare.

I submit these remarks, with perfect deference to the views of others, and in particular to those which may be held by the government, and in ignorance of the course of the discussion at home for the last three months.

I have, &c.,

GEORGE F. SEWARD.

No. 2.

Mr. Evarts to Mr. Seward.

No. 296.] DEPARTMENT OF STATE,
Washington, April 23, 1879.

SIR: As it has become evident that the Chinese ministers now in this country do not possess authority to treat with us in regard to questions growing out of the premises of their people in California, it has become desirable to proceed with negotiations at Peking. You will, therefore, enter upon the discussion so soon as you have reached your post.

The issues which are involved have been carefully discussed with you, and it is not now necessary to make extended remarks upon them.

Briefly stated, the features of the business which demand attention are as follows:

1. The belief prevails that many of the immigrants from China come under contracts to labor, and that some of them belong to the criminal and pauper classes; and that, without any change of the existing treaty-regulation of the subject, by a strict adherence to the same, such immigration would be greatly reduced.

2. Grave apprehensions are entertained on the Pacific coast that the Chinese will arrive upon our shores in larger numbers even than heretofore, and that social and political derangements will be occasioned, which will prove disastrous to the best interests of the districts affected. This apprehension this government shares, and is solicitous to press earnestly upon the attention of that of China the grounds of this apprehension and the proper course of negotiations to relieve it.

It is believed that inquiries may be made in China which will elicit the facts in regard to the immigration of contract laborers, paupers, and the like, and means devised in concert with the Chinese Government to prevent the departure of such persons for our shores. Your first duty upon arriving at your post will be to set on foot such an inquiry, and report thereafter the facts which may be ascertained, and the measures which the Chinese Government may be willing to undertake in pursuance of existing treaty stipulations and in concert with us to reduce or suppress the evil.

While conducting this negotiation, it is desirable that you should explain to the ministers of the foreign office the disorders and difficulties which over-immigration of their people into this country has occasioned, and that it is in the interest of our general relations and of their own people, that judicious provision should be introduced into our treaty relations to correct the mischiefs of excessive immigration.

As it is impossible to foresee the course of immigration, as our relations with China are peculiar, and our people resident there enjoy many extraordinary privileges, and as it is desirable to work out all

desired results without disturbing the good feeling now existing between the two countries, and without impairing the opportunities and prospects which inure to us under existing treaty stipulations, it is considered desirable, first to ascertain with precision the disposition of the Chinese Government, and to give assurances which will enable us to proceed afterward with the further negotiations which may be decided upon.

It is the wish of the President to conduct this negotiation in view of the general interests of our people both at home and in China, and you may look soon to receive a full exposition of the grounds upon which this government feels justified in expecting from the intelligent and friendly purposes of the Chinese Government, in its relations with us, such modifications of and additions to the existing treaty arrangements as may meet and remove the present embarrassments and grave apprehension caused by the actual or probable working of the emigration clauses of the Burlingame treaty.

In the meanwhile, the President desires no time to be lost nor pains spared in the branch of the subject which seeks a better restriction of immigration under the existing treaty, whose spirit and requirement seem to exclude every method of securing emigrants which is not openly and fairly based upon their free choice, their independent action, and supported by their personal resources in the transit and in the project of maintaining themselves here.

Your long acquaintance with the Chinese will enable you, it is hoped, to so conduct these immediate negotiations as to avoid or allay irritation, and thereby to lay a useful basis for the more serious negotiations which may need to follow.

You are authorized to call upon the consuls in China and at Hong-Kong for reports and assistance in carrying out these instructions, and to go yourself to the district from which the immigrants proceed, if it shall appear desirable to do so.

I am, &c., &c., &c.,

WM. M. EVARTS.

No. 3.

Mr. Seward to Mr. Evarts.

No. 450.] LEGATION OF THE UNITED STATES,
Peking, July 7, 1879. (Received September 1.)

SIR: Prince Kung having returned to the city, I paid my respects at the foreign office on the 5th instant, and am now in receipt of a note from the Prince saying that he will return my call to-morrow.

After this call has been made, I propose to open the discussion of the emigration matter. My present design is to approach the minister in a very quiet way, and to so manage the business, if possible, as not to touch their pride.

I have hesitated to set on foot the inquiry in regard to contract emigration indicated in your instructions. The consul at Hong-Kong has been for a short time only at his post, and the consul at Canton has a native interpreter in whose discretion I cannot confide.

Moreover, my plan of action leads me to avoid drawing unnecessary attention to the business at the moment.

The Viceroy at Tientsin dropped a remark in conversation with General Grant which indicated that this government is disposed to deal with the question of contract emigration in an accommodating way. Beyond this I have received as yet no intimation of their sentiments.

The prince and ministers were very cordial, and the prince appeared to be in better health than heretofore.

I have, &c., &c., &c.,

GEORGE F. SEWARD.

No. 4.

Mr. Seward to Mr. Evarts.

No. 457.] LEGATION OF THE UNITED STATES,
Peking, July 21, 1879. (Received September 5.)

SIR: I had the honor to advise you on the 15th instant that I had requested an interview with the ministers of the foreign office, in order to speak of the emigration question. Since that date I have had two conferences with them.

Believing, as I have stated in an earlier dispatch, that it would be wise to approach the subject in a quiet manner, I took pains in asking for a conference to intimate that I would not call, at the moment, for the presence of Prince Kung. He is much occupied with the various duties pertaining to his high position in the empire, and by leaving him out I should be able to take more time for the presentation of the matter, and I should have the advantage of recourse to him at a later moment, in case the ministers should not meet me in a satisfactory way.

I was much pleased on going to the Yamên, on the occasion of my first visit, to find there four of the most influential ministers, those in fact whom I should have selected, if I could have had a choice; and still more gratified upon meeting the same ministers at the second interview. It sometimes happens that the foreign representatives have to deal with a succession of ministers in getting their questions before the Yamên, the large number of that body and their habit of irregular attendance, making the transaction of business particularly tedious.

While aware that the President and yourself would expect to hear from me in regard to the emigration question at the earliest possible moment, and to be as fully informed as possible in regard to the views of this government, I have not felt that my instructions authorized me to lay before them any formal proposals. It has seemed to me that my first object should be to allay their irritation caused by the indications of a more positively hostile policy toward their people in America, and to assure them of our devotion to the broadest principles of liberal government and humanity, and in this way to provide for a continuance of that good understanding upon which the safety of great interests involved here depend, and more particularly, to prepare for an unrestricted discussion of the main question.

I may confess to you I could not readily take up before this government any other line of procedure. The ministers of the foreign office are men of mature years, habituated to the conduct of government on a large scale, by no means so ignorant of external affairs as many believe, sensitive in a high degree to any shadow of an implication affecting their nationality, courteous with a courtesy that is not of manner merely,

amenable to reason to a measure not generally supposed, surrounded, as all statesmen are, with difficulties, very open to the persuasion of their friends, but very deaf to arbitrary demands, and accustomed to turn to our government and to our legation for evidence of friendliness.

To speak to them brusquely or inconsiderately, under these circumstances, might do an injury to the negotiation of an irreparable sort.

It may be well to say here that the statements lately made in our newspapers that this government can only regret the President's veto of the fifteen passengers' bill is without foundation.

It is true that existing treaties press hardly upon the Chinese. They were made at a peculiar moment, and may need revision after a season. If, then, we had arbitrarily denounced the given treaty, undoubtedly they would not have lost sight of the precedent. But that they regret the fact that we have not given them an example of a doubtful sort, would have preferred that we had done so,—I do not believe. It would have left their people in our country, as they would believe, at the mercy of the popular sentiment of the moment, and would have left the ministers themselves open to a charge of having failed in their conduct of international affairs. I see no reason to doubt that they are as anxious almost to sustain the treaty as we can be to preserve the earlier treaty upon which our general position here depends.

I condemn also the similar statement that this government does not care whether its people emigrate. I do not think that Chinese statesmen are disposed to look to emigration as a means of improving the condition of their people, but they have come to consider their foreign relations as important, and the statesmen charged with the duty who should neglect to defend the national prestige would be made the subject of grave attack.

The foreign office in particular is as sensitive as foreign offices generally, and its members would not willingly encounter the charge that they have abandoned any of the interests committed to them.

And, moreover, the sooner we rise to the idea of dealing with this government as being actuated by very much the same motives of dignity, patriotism, and public policy which actuate other governments, the sooner we shall be able to place our relations upon an enduring basis of good-will and common interests.

I do not think it necessary to repeat now the statements of fact and considerations of policy which, in my interviews with the Yamên, I placed before the ministers present. The situation in California as it is, and the action of Congress of last winter, was explained to them with such details of an administrative and political sort as would give them a clear idea of the matter.

I spoke freely and frankly, dwelling with some particularity upon certain special evils attending the immigration of their people into our country, such as the importation of criminals, paupers, lewd women, and contract laborers, and of the apprehensions which we feel, under our form of government, at the arrival upon our shores of large numbers of people whose traditions and purposes do not fit them to take a place in the social and political constitution of our population.

In making my statements to them, I counted, of course, upon their general knowledge of our affairs, and of the course of recent discussions with us.

Much of what I had to say, under these circumstances, was explanatory, requiring no great expenditure of time. I counted, too, in a very marked degree, upon their general good feeling toward our country,

and their knowledge of my own direct way of dealing with matters committed to me.

Without entering into detail, I think that I may pronounce the interviews satisfactory in a marked degree. The ministers did not speak out with perfect freedom, and in the absence of the prince, and in advance of careful deliberation, I did not expect that they would do so. But there was not an unfavorable incident occurred, and when, at the close, they said that they would place the business before the prince for his views, I felt that their influence with him would run in the direction of an amicable and appreciative reception of our statements, and that I might expect to receive in response some indication of their disposition which will point the way to further discussion, and a more particular definition of purposes.

It may be some days before I hear from the ministers.

My further action must depend upon circumstances. My hope is that I shall not have occasion to go into further talk, but simply to report to you for instructions. It is always possible, however, that the Chinese may bring up for discussion, either general questions affecting the situation, or special complaints based upon representations received by them from their legation and consulates in the United States.

Until the ministers inform me that they have received the instructions of the prince, and are ready to speak further, the business must be considered, of course, in abeyance. I expect to hear from them within a week.

I have, &c., &c., &c.,

GEORGE F. SEWARD.

No. 5.

Mr. Seward to Mr. Evarts.

No. 467.] LEGATION OF THE UNITED STATES,
Peking, August 1, 1879. (Received September 29.)

SIR: I had the honor to inform you, on the 21st ultimo, that I had spoken with the ministers of the foreign office in regard to the situation created in our country by the immigration of their people; that they had listened to my statements with marked attention, and had responded that they would consult with Prince Kung, and grant me a further interview at an early moment.

On the 26th ultimo, the full body of ministers, the prince excepted, came to the legation, and a conversation ensued which is set forth in the letters which have since passed between Prince Kung and myself, copies of which I inclose herewith.

In regard to these letters I should say at once that it was not my purpose to enter upon a correspondence, but finding that the Chinese were intending to bring forward, in writing, intimations of anxiety, as to the treatment of their people in California, I had no alternative but to take the initiative.

While the business has thus been given a more formal character than Iproposed, we are now, at any rate, in full possession of the views of the Chinese.

You will see that they assert the obligations of existing treaties; that they are anxious about the condition of their people in California, and

that they are disposed to deal at once with the grievances which they believe can be justly urged by us, namely, those growing out of the arrival upon our shores of criminals, lewd women, diseased persons, and contract laborers.

You will notice also that I have by no means confined my representations to the matter of contract emigration, and that I have pointed in a pertinent way to further representations which we may find it necessary to make.

While this is true, I am compelled to say that it is not, in my judgment, desirable to press the Chinese further at the moment. In so declaring I do not concern myself with the question whether, as a matter of principle, we can see our way to exclude free emigration. That, of course, must be determined at home. But I am clearly of opinion that, if such a proposal is to be advanced, it will come more opportunely after we have observed the effect of the restrictive measures under the treaty now open to us. Such delay will give time for the irritation produced by recent events in America to pass away, and will demonstrate our desire to take no extreme steps unnecessarily. And, as I have heretofore pointed out, we cannot hope for the success of purely diplomatic recourse, unless we approach the Chinese from the standpoint of respect. Such a negotiation, instituted under the most favoring circumstances, would have to be conducted with carefulness, and it would consume much time, for it would involve all our relations and their readjustment on a basis of reciprocity.

I have not thought that I am authorized to enter upon a discussion of details for the suppression of contract emigration, &c.

It might mislead the Chinese if I should do so, and it might embarrass you. I may say, however, that the system which the Chinese may be brought to agree to would provide for the examination by Chinese officials, at Canton or elsewhere, of all persons proposing to emigrate. To give it effect we would have to provide qualified and trustworthy officers, deputies of the appropriate consuls, to take part in the examinations, and to instruct the consul at Hong-Kong, or other point of departure, to pass for emigration no Chinese not provided with certificates from the examiners. We should need no legislation, perhaps, excepting appropriations for the pay of such officers.

I mean no disrespect for the consuls who have served at Hong-Kong when I say that their examinations of persons proposing to emigrate have not been efficient. Such work, as I know by personal experience, can be done thoroughly only by the Chinese themselves.

It is not possible to estimate accurately the effect upon the general movement of the Chinese to America which would result from the adoption of this system, but I believe that it would be important. Taken with the usual return flow of emigrants, it seems to me probable that it would occasion a gradual diminution of the number of Chinese in our country.

Touching the inquiries of the ministers as to recent legislation in California and the ill-treatment of their people, I should say that it became evident at an early moment that I could not hope to escape from such questions. It was equally evident that I could not do otherwise than respond in a frank and outspoken manner. It is more than likely that my course may have saved you from the presentation at Washington of more pertinent and positive questions.

I am still without the means to prosecute the inquiry regarding contract emigration which I was instructed to make by your dispatch number 296; and I should hesitate to undertake it at the moment if I could,

lest it might stir up unnecessary discussions, and interfere with future negotiations. Perhaps the occasions for it has passed.

I shall feel no great anxiety as to my ability to secure a draught of satisfactory rules for the guidance of examiners at Canton or elsewhere, if you instruct me to do so.

Recognizing the importance of this business, I have dealt with it carefully and to the best of my ability. That all has been accomplished which has been proposed cannot be said.

That much has been done I feel to be true; and I know that our people in this part of the world, merchants and missionaries, would be much reassured if they could know even that the disruption of our relations with China may be averted.

I look with anxiety for your further instructions, and shall feel greatly relieved if they indicate a more or less perfect approval of my course.

I have, &c., &c., &c.,

GEORGE F. SEWARD.

[Inclosure 1 in No. 467.]

Mr. Seward to Prince Kung.

JULY 30, 1879.

SIR: At interviews held with the ministers of the foreign office on the 16th and 19th instant, I had the honor to place before them, by instruction of my government, a statement concerning the situation created in the United States by the immigration of large numbers of your people, including many who may be classed as criminals, lewd women, diseased persons, and contract laborers, indicating that the moment has arrived for the two governments to study the subject with a view to arrive at an understanding which will be mutually satisfactory.

The ministers listened to my statement with great courtesy and attention, and after consulting with your imperial highness, they were so kind as to come to our legation and to say that they do not think it strange, in view of my explanations, that the immigration of your people is the occasion of difficulty, and that without entering further upon the discussion of the question at the moment, they are prepared to meet our wishes so far as to undertake at once to concert measures with us to suppress the emigration to our shores of the four classes mentioned above.

It becomes my duty to communicate this result of my representations to my government; and in order that I may do this in a more precise manner, I now beg leave to ask your Imperial Highness to confirm in writing what I have written above.

I seize the occasion to repeat to your imperial highness the statement which I made to the ministers, that my government prizes very highly the good relations which have always existed between our two nations, and will appreciate the very frank and considerate manner in which your imperial highness and the ministers of the foreign office have dealt with us.

I have, &c.,

GEORGE F. SEWARD.

[Inclosure 2 in No. 467.]

Prince Kung, chief secretary of state for foreign affairs, herewith makes a communication.

The emigration of Chinese to California for purposes of labor is provided for in our treaties. I hear that the respectable, educated, and mercantile classes in that State are kindly disposed toward our people, but that low-class Irish and persons of that sort persistently abuse them. Heretofore they have contented themselves with insulting and beating the Chinese, but now they pursue them to their dwellings, which they plunder and burn, and they threaten employers, thus preventing the employment of our people. New ordinances, such as those in regard to cubic feet of air, forbidding the return to China of buried bodies, not allowing Chinese to testify in courts, cutting their queues, and requiring security, have been enacted, which are oppressive, and they provoke the gravest fears from myself and the ministers.

Recently a dispatch was received from Mr. Yung Wing, assistant Chinese minister to the United States, stating that an anonymous letter had been addressed to the Chinese consul at San Francisco, denouncing the anger of many upon him for his efforts to protect our people, and threatening his life.

A copy of the new constitution of California has also been received from Mr. Yung Wing. It contains provisions inserted expressly for the purpose of obstructing the Chinese. If this be true, it will not only prevent our people from going to California, but will also produce constant distress among those who are now there. The prince and ministers are wholly at loss to understand the occasion of all this.

The ministers recently spoke to your excellency about the Chinese in California, and asked you whether your government would consent to the present treatment of our people there, and to the adoption of a State constitution at variance with the Constitution and treaties of the United States, or whether it cannot protect them in accordance with the treaties? You responded that the new constitution was adopted by the State of California, and that if it is in conflict with the Constitution and treaties of the United States, under your system where the departments of government are very distinct, any cases arising would go to the courts, and such parts of the new constitution as were in conflict with the Constitution of the United States and its treaties with foreign powers would be declared null and void.

We are glad to see from this that the Government of the United States has no intention to oppress our people. But in case of a Chinese suffering wrong, even though thereafter he secures redress through the courts, he still will have been put to inconvenience. Prevention of wrong is better than redress.

Your excellency also remarked that if measures were taken by us to prevent the emigration of criminals, lewd women, diseased persons, and contract laborers, your government would labor under less embarrassment in protecting our people.

I now have the honor to request your excellency to transmit this summary to your government, with the request that it will take energetic measures to protect our people in peace, in pursuance of treaty obligations and as a proof of friendly feeling.

And I beg that after perusing carefully these extracts of recent conversations you will inform me whether they are correct.

Hon. GEORGE F. SEWARD.

PEKING, *July* 31, 1879.

[Inclosure 3 in No. 467.]

Prince Kung, chief secretary of state for foreign affairs, herewith makes a communication in reply.

I have had the honor to receive your dispatch of the 30th instant, stating that by instruction of your government you had placed before the ministers of the foreign office a statement of the situation created in the United States by the immigration of large numbers of Chinese including many who may be classed as criminals, lewd women diseased persons, and contract laborers indicating that in the opinion of your government the time had come to study the subject in order to arrive at a satisfactory understanding. You add that the ministers of the foreign office, after consultation with me informed you that they are prepared to meet the views of your government so far as to undertake at once to concert measures to suppress the emigration to your shores of the four classes named above, and you add that it becomes your duty to communicate to your government the result of your representations, and in order to do this in a more precise way, you ask me to confirm in writing what has been said, &c., &c.

In response I beg leave to observe that the emigration of Chinese to the United States for purposes of labor is provided for in our treaties. It is the province of China to see that each person goes of his own free will and accord. And it is the duty of the United States under the treaty to protect the Chinese who may go thither. Inasmuch as your government meets with certain difficulties in connection with this immigration, it is proper to consult some satisfactory line of action concerning criminals, lewd women, diseased persons, and contract laborers. Leaving aside the first three named classes, I understand the phrase "contract laborers" to include all persons who are allured to go abroad.

I am ready to meet the wishes of your government so far as to prevent the emigration of the four classes named above as a measure of friendship and good will.

The foregoing is, however, only an agreement in general terms. It will, of course, be necessary hereafter to draw up rules in detail for mutual observance.

In regard to the Chinese who have already gone to the United States, it is presumed that your government will use every exertion to protect them in their treaty rights, to the end that no break may ever arise in the mutual friendship of the two nations.

Hon. GEORGE F. SEWARD,

PEKING, *July* 31, 1879.

[Inclosure 4 in No. 467.]

Mr. Seward to Prince Kung.

AUGUST 1, 1879.

I have had the honor to receive your imperial highness's dispatch of yesterday setting forth information which you have received from your agents in the United States of the ill-treatment of your people, referring to the anxiety caused more particularly by the new constitution of California, and quoting a report made to you by the ministers associated with you in the foreign office of a conversation which they have held with me on the subject.

When the ministers spoke to me, I responded substantially as they have stated, but more fully, although I could not, of course, know the details of the grievances alluded to. The ministers received what I said, as they have always done on like occasions, with indications of abiding faith in the integrity and generosity of my government. They know that for many years your people have been going to America in large numbers, sometimes at the rate of 20,000 in a year, and that down to the present moment they have been accorded all the opportunities which our own citizens possess to prosecute the various avocations of life and to enjoy the fruits of their labors. Isolated instances of ill-treatment and unfriendliness have undoubtedly occurred, but it is to be said that it is not easy for a government to give perfect protection to its own people, and that the task is greater when those affected are strangers, of different language and habits of life.

In speaking with the ministers, I asked them to remember these things and to consider also what difficulties you would encounter if our people should pour in upon you in a similar manner.

The new constitution of California is a local law, as distinguished from the laws of the general government. As such, it must yield, of course, when found to be in conflict with the latter, or with treaties with other powers.

How far it may be in conflict will be developed gradually in the decisions of the courts.

These are open to your people for the redress of wrongs, public and private, and while the process is slow, it is the most certain one which Western governments have been able to develop. Perhaps your people, not altogether familiar with our system, and until recently having no representatives of their nation present, have not always sought the redress open to them.

Doubtless some part of the hostility to your people, which has grown up lately in the midst of what I may rightly describe as general friendliness, may be traced in some measure to the fact that in spite of all our efforts to prevent their coming many criminals, diseased persons, lewd women, and contract laborers have arrived upon or shores and given our people false ideas of the character of yours. I hope that your prompt tender of concerted action to prevent the emigration of such persons will be productive of much good.

My government is disposed to study the whole subject of our relations in a thorough and generous manner. I know that I am not wrong in reporting to the President that your disposition is the same, and that you will always give a candid hearing to the representations which, from time to time, we may find it necessary to make, as we shall do to your representations, and that our mutual object will be the righting of grievances and the adjustment of relations in an honorable and satisfactory manner.

I am, &c., your imperial highness's humble servant,

GEORGE F. SEWARD.

No. 6.

Mr. Seward to Mr. Evarts.

No. 472.] LEGATION OF THE UNITED STATES,
Peking, September 9, 1879. (Received November 4.)

SIR: I have the honor to hand to you herewith a copy of a dispatch which I have received from the consul at Hong-Kong, reporting the number of emigrants to San Francisco which left his port during the year ended June 30, 1879.

I anticipate a very light emigration for the remaining months of the calendar year.

I have, &c.,

GEORGE F. SEWARD.

[Inclosure in No. 472.]

Mr. Mosby to Mr. Seward.

HONG-KONG, *August* 22, 1879.

SIR: In compliance with the request contained in your letter of the 12th ultimo, I inclose herewith a statement of the number of Chinese emigrants, male and female, who have left this port for San Francisco during the year ended June 30, 1879, as shown by the records of this office.

I have, &c.,

J. S. MOSBY.

Statement of male and female Chinese emigrants hence to San Francisco, month by month, for the year ending June 30, 1879.

Date.	Males.	Females.	Total.
1878.			
July	102	14	116
August	120	23	143
September	20	0	20
October	134	37	171
November	137	8	145
December	None.	None.	None.
1879.			
January	50	26	76
February	675	12	687
March	613	5	618
April	1,044	8	1,052
May	2,346	18	2,364
June	465	2	467
Total	5,706	153	5,859

J. S. MOSBY.

United States CONSULATE,
Hong-Kong, August 22, 1879.

No. 7.

Mr. Seward to Mr. Evarts.

No. 515.] LEGATION OF THE UNITED STATES,
Peking, November 26, 1879. (Received January 7.)

SIR: I have the honor to hand to you, herewith, a further statement from Mr. Consul Mosby, showing the number of Chinese who left Hong-Kong for San Francisco, during the quarter ended September 30, last.

The total number as you will see was 853. The number for the fourth quarter will probably be less.

I have the honor, &c., &c., &c.

GEORGE F. SEWARD.

[Inclosure in No. 515.]

Mr. Mosby to Mr. Seward.

HONG-KONG, *October* 29, 1879.

SIR: In accordance with your request contained in your letter dated August 22, 1879, I inclose herewith a statement of the number of Chinese emigrants, male and female, who have left this port for San Francisco during the third quarter ending September 30, 1879.

I have, &c.,

J. S. MOSBY.

Statement of male and female Chinese emigrants from Hong-Kong to San Francisco during the quarter ended September 30, 1879.

Date.	Males.	Females.	Total.
July	254	7	261
August	248	5	253
September	333	6	339
Total	835	18	853

No. 8.

Mr. Seward to Mr. Everts.

No. 614.] LEGATION OF THE UNITED STATES,
Peking, March 1, 1880. (Received April 26.)

SIR: The foreign press of China has published of late various statements indicating that the emigration of Chinese to the Sandwich Islands is being promoted by the Chinese Steam Navigation Company with the approval and concurrence of this government. Statements have also been made that emigration to Cuba will soon begin again.

In view of these statements, I have thought it well to inquire at the foreign office whether the information is correct. Mr. Holcombe waited upon the ministers accordingly yesterday, and was told promptly that the government had not assented to the reopening of emigration to Cuba, and has done nothing looking to the promotion of emigration to the Sandwich Islands.

It is quite certain that this government will prevent the emigration of its people to Cuba until all outstanding questions with the Spanish Government are disposed of, and that it will disfavor in a more or less positive way emigration to the Sandwich Islands.

All statements that it is moving to encourage emigration in any direction may be considered unfounded.

I have, &c.,

GEORGE F. SEWARD.

No. 9.

Mr. Seward to Mr. Evarts.

No. 636.] LEGATION OF THE UNITED STATES,
Peking, March 20, 1880. (Received May 11.)

SIR: The consul at Hong-Kong has not furnished me, although requested, with any information in regard to the movements of emigrants

from Hong-Kong to the United States during the last quarter of last year. I am therefore addressing to him a letter, a copy of which I inclose herewith.

I have found an interesting item concerning emigration in the London Mail of January 30, 1880, and inclose a copy to you.

I have, &c.,

GEORGE F. SEWARD.

[Inclosure 1 in No. 636.]

Mr. Seward to Mr. Mosby.

LEGATION OF THE UNITED STATES,
Peking, March 20, 1880.

SIR: I beg leave to ask you to favor me with a statement of the number of emigrants who left Hong-Kong for San Francisco during the last quarter of last year, and also to send to me similar statements for ensuing quarters. I am authorized by the Department to ask you for information bearing upon this subject, and I shall be pleased to receive any that you may be able to communicate, and which, in your opinion, should be known to the representative at this court.

I am, &c.,

GEORGE F. SEWARD.

[Inclosure 2 in No. 636.]

[From The Mail, London, Friday, January 30, 1880.]

LATEST INTELLIGENCE.

THE UNITED STATES.

[By the Anglo-American cables, from our correspondent.]

PHILADELPHIA, *January* 30.

California advices indicate that the number of Chinese returning to China is larger than the number of arrivals. During the fourteen months ending December, 5,699 Chinese arrived in San Francisco, and 10,947 departed for China. The exodus increases as time advances. During November and December 571 Chinese arrived, and 2,119 departed.

No. 10.

Mr. Seward to Mr. Evarts.

No. 649.] LEGATION OF THE UNITED STATES,
Peking, March 31, 1880. (Received June 8.)

SIR: The reports on trade submitted annually by the commissioners of customs at the open ports of China have been made complete to the end of 1878 by the issue of a volume for that year. I have given the several papers contained in it careful examination, and I shall have occasion hereafter to remark upon various topics dealt with in them which have attracted my attention.

At the moment I beg leave to place before you some pages which I have cut out from the Canton report, having reference to the scheme

to promote Chinese emigration to Peru, with which our countrymen, Messrs. Olyphant & Company, were identified, and which resulted disastrously for them.

While I am satisfied that the statements of the report are generally overdrawn, it is quite certain that the Chinese authorities at Canton, moved in this direction, perhaps, by certain foreign interests, felt an honest distrust of the whole business. To this distrust the course innocently pursued by Messrs. Olyphant & Company, but with lack of prudence, gave additional strength.

As the scheme was one concerning the Peruvian Government, and as the first vessel engaged for the traffic was not American, but Belgian, the business did not seem to call for the interference of this legation prior to my departure for America in June, 1878. Our consul at Canton was understood to have acted unofficially in aid of Messrs. Olyphant & Company, but no report had been sent by him to me, excepting a single private letter, a copy of which will be found with Mr. Holcombe's dispatch, No. 24, July 5, 1878. It is only since I have read the statements of the Canton report, and in their connection examined the correspondence on file in this office, that I have learned the details of Messrs. Olyphant & Company's attempt to procure emigrants and of their failure.

The Chinese, it may be said, can appreciate the difference between the two ways of emigrating set forth below. If a steamer comes into one of their ports and advertises to take freight and passengers to some foreign country, and if individuals come forward, apply for passages, pay for them, and in due season, without constraint, repair on board with their luggage, there is not anything in the circumstances calculated to arouse their suspicions. But if they find that efforts are being made to procure passengers, through agents employed for the purpose; that those engaged belong to the poorest and most ignorant class; that they have no means with which to pay for their passages; that they have to be cared for even until the sailing day, and furnished perhaps with clothing, it is not strange that the circumstances should appear to call for examination.

It seems that Messrs. Olyphant & Company fell into the serious error of endeavoring to conduct their business in the latter way.

Now, there is nothing immoral in what they then did. They had a contract with the Peruvian Government under which they were to establish a line of steamships between China and Peru. They were to receive a heavy subsidy. The Peruvians expected to receive in return a considerable number of Chinese free emigrants, and certain other benefits. It was possible for Messrs. Olyphant & Company to believe that when they made known to the given Chinaman the fact that he could get good employment in Peru, and that they would transport him thither for $80, if he could pay so much, or for nothing at all if he could pay nothing, they were acting only a very kindly part. It is quite possible for us to believe just as they did.

But their error lay in this: They forgot that the cooly trade, pure and simple, had been conducted from the China coast in very much the same manner as that in which they were proceeding. The cooly had been incited to go; he had been provided with lodgings and necessaries while awaiting his ship; he had been promised a certain monthly wage after his arrival abroad; the least possible had been said about the deduction of his passage expenses from his wages to be earned abroad. In the one case undoubtedly fraud was intended from the beginning, and was carried so far that the African slave trade was attended by

few greater horrors. In the other case, undoubtedly the disposition was to deal in the most fair manner. But the procedure in both was so nearly the same that trouble only could have been expected. The last thing that the house of Olyphant & Company ever intended to do was to enter into the cooly trade, and yet they proceeded so like the old cooly traders that they submitted themselves, not only to the danger of being attacked as such, but also of putting their whole enterprise in risk.

Although I had not considered the enterprise one in which this legation was concerned, had perhaps been led too far by a sense of deference to the Peruvian Government and a disposition to allow them to manage their own affairs, my letter in response to the one from the consul at Canton, to which I have already referred, will indicate that I foresaw some of the difficulties, and pointed out the only means by which they could be avoided.

After saying that the Chinese could not refuse to allow free emigration, I wrote as follows:

> As to what constitutes free emigration you must be guided by a careful examination of our statutes in regard to the cooly trade. It is very doubtful whether it can be considered allowable to take emigrants who are to pay their passages at the other end. * * * Looking to this fact you should consider whether it is not desirable to speak freely with the viceroy, and to arrange with him rules for emigration. * * * I suggest this as a way of dealing with the business which cannot be caviled at.

To those members of the house of Olyphant & Company, with whom I had the opportunity of speaking, I used the same language.

It is impossible, of course, to sustain the course pursued by the Chinese authorities. They should have stated the conditions of emigration in clear terms, and have adhered to them. This they did not do, but advanced one objection after another until it became impossible to comply with their conditions. How far this course was pursued deliberately in order to prevent all emigration to Peru, or was the result of Chinese peculiarities of administration and the methods of the given viceroy, cannot be told.

I had occasion a few days since to remark upon the movement to promote Chinese emigration, now being set on foot by the Government of Brazil. That government will no doubt profit by the experience of Peru, yet it becomes doubtful whether they will be disposed to take up the patient and somewhat expensive policy which is the only one which will be successful.

I have, &c.,

GEORGE F. SEWARD.

[Inclosure in No. 649.]

CANTON REPORT ON TRADE FOR THE YEAR 1878.

EMIGRATION.—While the Australian colonies are following the example of California in demanding that legislative measures be adopted to restrict the immigration of Chinese, the attention of the Chinese authorities of this province was occupied during the months of May and June by an attempt to reopen the emigration of Chinese laborers to Peru, formerly carried on from Macao. Some time in 1877 an American firm, Messrs. Olyphant & Co., had entered into a contract with the Peruvian Government to run a line of large steamers between Peru and China for the conveyance of mails, passengers, and cargo. The object of the Peruvian Government in establishing this new line was to afford facilities for the importation of Chinese labor into Peru, where it was urgently needed to develop the agricultural resources of the country, and more particularly for the cultivation of the sugar fields. Messrs. Olyphant &

Co.'s contract was to cover a period of five years, during which they were to receiv an annual subsidy of $160,000, and certain concessions in connection with the sale o what are known as "nitrates." In return their steamers were to make 28 trip a year between China and Peru calling at the Sandwich Islands—where Chinese labo is also required—*en route* and importing not less than 500 Chinese laborers each trip It was originally the intention of Messrs. Olyphant & Co. that their steamers should start from the British colony of Hong-Kong, and the first steamer of the new line arrived there on the 24th November, 1877. She belonged formerly to the P. & O. Company, and was entered as the British steamer Nemesis from London, but on the 15th December, her flag and name were changed and she became the Belgian steamer Perusia, of Antwerp. Application was made in due course to the Hong-Kong government for permission to embark Chinese passengers by the company's steamers for Peru and the Sandwich Islands, and it was asked that the same facilities might be extended to them as were allowed to the American mail steamers in the shipment of Chinese passengers to San Francisco. This, however, was refused by the Hong-Kong government, and, acting under stringent orders from home, Messrs. Olyphant & Co. were notified that not only would no Chinese passengers be allowed to embark in the Perusia for the Sandwich Islands or Peru, but that they would be required to give a bond that the fittings which were being put up in the Perusia should not be used for the conveyance of passengers to Peru from any port in China. This settled the question as far as Hong-Kong was concerned, and the Perusia left on her first trip for Callao without passengers. Shortly afterwards an English vessel, the Charter Oak, was refused permission to embark passengers from Hong-Kong for Honolulu.

It was then decided by the agents that on the return voyage the Perusia should come to Canton to embark her passengers, and, accordingly, early in the year, the United States consul informed the governor-general of the Two Kwang of the establishment of the new line, between Canton and Callao, stating that the steamers would take passengers and cargo like any other steamers, and that on their return voyage to China they would bring back, at the expense of the Peruvian Government, any Chinese who were entitled to repatriation under the terms of the Peruvian treaty. This passenger emigration was to be carried on in conformity with the stipulations of that treaty, the 6th article of which reads as follows, in the English version: "The Republic of Peru and the Empire of China, cordially recognize the inherent and inalienable right of man to change his home. Their citizens and subjects respectively may consequently go freely from the one country to the other, for the purpose of curiosity, trade, labor, or as permanent residents. The high contracting parties, therefore, agree that the citizens and subjects of both countries shall only emigrate with their free and voluntary consent, and join in reprobating any other than a free and voluntary emigration for the said purposes and every act of violence or fraud that may be employed in Macao or the ports of China to carry away Chinese subjects." The Chinese version says that "methods for collecting emigrants of whatever kind are not allowed." At the consul's request, the district magistrate was directed to prepare a proclamation in this sense. Special prominence was given to that part of the scheme which secured the return of Chinese from Peru, and it was added that as passengers would doubtless embark in these steamers for Peru, on the return voyage, special precautions were to be taken to guard against their being induced to go on board by fraudulent means. Two officers were deputed by the governor general to see that these provisions were carried out.

The Perusia arrived at Whampoa, the port of Canton, situated on the river twelve miles below the city, on the 4th May, on her return from Peru. About the same time Messrs. Olyphant & Co. opened two agencies in the suburbs of the city, under Chinese names, where intending passengers for Peru were to be lodged and fed until the time came for the steamer to sail. The Chinese authorities were not informed of the opening of these houses, and when it was found that a lot of destitute people were being collected together by Chinese brokers and brought there, the suspicions of the neighborhood were excited and numerous petitions on the subject were presented to the governor-general. As the opening of these houses without the sanction of the local authorities was clearly illegal, and as all practices connected with the employment of agents were placed under very stringent regulations by the emigration rules of 1866, the governor-general at once ordered that the agencies should be closed, and that all Chinese found therein should be arrested and examined. This was done on the 10th May. It was elicited at the examination that the agents employed were to receive so much per head for each cooly brought in; that the coolies were to be provided with lodging and food until they were embarked; that they were each to receive a suit of clothes; and finally were to be provided with passages to Peru. The whole of these advantages estimated at $90 ($80 of which represented the passage-money) were to be refunded by the emigrant to Messrs. Olyphant & Co., out of his earnings in Peru. The passage-ticket—a very elaborate document drawn up in English and Chinese—contained an acknowledgment by Messrs. Olyphant & Co. that the passage-money had been received, and a certificate signed and sealed by a notary

public that the amount had been paid. The cost of this formality formed part of the obligation undertaken by the emigrant for future liquidation.

These facts being ascertained, it could no longer be doubted that these coolies were not *bona-fide* passengers wishing to take advantage of the establishment of a line of mail steamers to proceed to Peru in an ordinary way. It was evident that Messrs. Olyphant & Co. were engaged in a scheme of cooly emigration, which in China is very wisely placed under very stringent regulations, and which, besides, as agents of the Peruvian Government, they had no right to embark in, as Peru had expressly agreed, in the treaty recently concluded, to give up such emigration for the future. So when an application was made by Messrs. Olyphant & Co., on the 24th May, to ship "1,050 steerage or deck passengers" by the Perusia, the governor-general required that each passenger should appear before a commission sitting at the custom-house, to be examined as to his willingness to go abroad, and as to whether or not he had paid his own passage. The prepayment of passage-money, which was the crucial test applied to determine that the people about to embark were *bona-fide* passengers and not cooly emigrants, was one of the stipulations included in the emigration rules of 1866, in which it is declared that "the Chinese Government throws no obstacle in the way of free emigration; that is to say, to the departure of Chinese subjects, of their own free will and at their own expense for foreign countries; but all attempts to bring Chinese under an engagement to emigrate, otherwise than as the present regulations provide, are formally forbidden." This stipulation as to the personal payment of passage-money was also insisted on in the convention for the regulation of the Chinese emigration to Cuba, concluded with Spain in November, 1877, and ratified towards the close of the present year. Messrs. Olyphant & Co. submitted, under protest, to the governor-general's demands; and accordingly, on the 6th June, between sixty and seventy passengers were brought to the custom-house for examination. After the examination had proceeded for some time, and about forty of those presented, whose answers were straightforward and connected, had been passed, seven of those still waiting came forward, threw down their passage-tickets, and declared that they were unwilling to go to Peru. They stated, in answer to questions, that they were destitute persons, of various cottages, out of employment; that they had been met in the street by persons unknown to them, and taken to one of Messrs. Olyphant & Co.'s depots, where they had been given food and clothing. It was explained to them that they were required to go to Peru, where they would receive constant employment and good wages. They were told that Messrs. Olyphant & Co. would pay their passages to Peru. Some understood that they would have to repay Messrs. Olyphant & Co.; others were not told so. They were also told at the agency that when they went before the consul and commissioner of customs, they must say that they had paid $80 apiece for their passage-tickets; and if further questioned as to how they had procured the money, they were to reply that it had been given them by an uncle or father, or some relative.

When this incident was reported to the governor-general he immediately decided that a more rigid examination must be applied than mere questioning, to ascertain the *bona fides* of the intending passengers; and it was accordingly notified that each passenger must produce the guarantee of a respectable shopkeeper, vouching for the truth of his statements, before he would be allowed to embark. The 41 passengers who had been passed previous to the dissatisfaction of the seven who threw down their tickets were brought back and re-examined. Twenty-four of their number being unable to produce the required guarantees, were rejected and refused permission to re-embark. Finally, 137 passengers in all having produced sureties satisfactory to the Chinese officials, were permitted to embark in the Perusia. Of these 118 took passage for the Sandwich Islands (Honolulu), and 19 for Peru. The United States consul, who was supported at a critical period of the negotiations by the presence of an American sloop of war, summoned to Canton for the purpose, has protested, on behalf of Messrs. Olyphant & Co., against the measures adopted by the Chinese authorities, and indemnity is claimed for all losses sustained. The matter has been referred to Peking and the case is not yet settled. The Perusia, after being detained some time by her agents at Whampoa, left for Honolulu and Callao on the 22d July. Messrs. Olyphant & Co.'s contract with the Peruvian Government has fallen through, the firm having been declared bankrupt.

The action of the Chinese authorities has been much blamed in certain quarters for interfering to prevent the prosecution of a scheme of emigration, which, it was claimed, would not only have been very advantageous to Peru, but would have greatly benefited the coolies that would have gone there; and it was argued that the high commercial standing of the American firm and the recent treaty engagements of the Peruvian Government, afforded a reasonable guarantee that the undertaking would be carried out in good faith, and that the laborers would be well treated. But it must be remembered, in justice to the Chinese authorities, that the scheme, as it developed at Canton, was found to be something essentially different from what they had been led to expect; that instead of their being simply required to sanction the embarkation of Chinese passengers in a regularly established line of mail steamers to Peru, as is

done by the Hong-Kong government in the case of the American mail steamers for San Francisco, they found on inquiry that the principal, if not the sole object of the new company was to procure a supply of Chinese laborers for the Peruvian sugar plantations; that these laborers were being collected by Chinese agents and lodged in houses opened without authority and in defiance of regulations, and that their passage-money was to be advanced to them by Messrs. Olyphant & Co., to be subsequently refunded out of their earnings in Peru. With these facts before them, guided by the very stringent regulations on the subject of emigration, and influenced no doubt by the recent action of the Hong-Kong government and the strong opposition of the local gentry, they could hardly do otherwise than apply an effective test to insure that *bona-fide* passengers and no others should be allowed to embark.

As regards the present position and treatment of Chinese laborers in Peru, the following extracts from the report of Mr. St. John, British secretary of legation in Peru, for the year 1877, are interesting and instructive. Mr. St. John states that "the system of contract labor, as carried out in Peru, is as bad as it can well be. The Chinese were too often entrapped in their own country, or were criminals or beggars, many of them totally unfitted for the work for which they were destined, and were crowded into sailing vessels where vitiated air and inferior food carried off a large percentage. In too many ships it was the middle passage over again. Their contracts were for eight years, at $4 per month. The proprietors who required laborers had to pay for each workman, in cash, about $400, or £75 for passage money and preliminary expenses, and then looked upon these men as their property, and often treated them as slaves, having the power to flog, put in irons, and otherwise punish these unfortunate creatures. Some proprietors, however, saw the advantage of well-treating their men, and fed them properly, and these are now reaping the advantage in finding many remaining in their service after the expiration of their contracts, and having fewer runaways. However, the general treatment of the laborers must be considered as having been very bad, and created a general feeling of disgust. That it has improved there can be doubt, but the Chinese remain still practically unprotected, and can obtain no redress either from the excesses of the proprietors or the exactions of the petty police. At present the price for contract labor is $4 per month. The contract was intended to be for silver dollars, but now the Chinese are paid in paper, which is worth from 1*s.* 8*d.* to 2*s.* 6*d.* per dollar. An attempt was made to introduce Chinese coolies from San Francisco, but the wages offered were lower than those that can be earned in California, and no one has as yet taken advantage of the contracts." With reference to the contract with Messrs. Olyphant & Co., Mr. St. John remarks that "as under this system the coolies will have to enter into contracts to pay off passage-money and other expenses, it would probably lead to a return of the old abuses."

Towards the close of the year the convention concluded with Spain for regulating the emigration to Cuba was ratified at Peking. By the first article Spain renounces the right of carrying on the old contract emigration, the stipulation in the old treaty regarding it being expressly expunged, while the fourth article states that Chinese will be allowed to go to Cuba in future, provided they pay their own passages.

No. 11.

Mr. Seward to Mr. Evarts.

No. 674.] LEGATION OF THE UNITED STATES,
Peking, May 1, 1880. (Received June 14.)

SIR: I have the honor to hand to you, herewith, a copy of Mr. Mosby's letter numbered 79, of the 12th ultimo, reporting the number of Chinese emigrants who departed from Hong-Kong for the United States during the fourth quarter of 1879, and the first quarter of the current year.

I have, &c.,

GEORGE F. SEWARD.

[Inclosure in No. 674.]

Mr. Mosby to Mr. Seward.

APRIL 12, 1880.

SIR: In compliance with the request contained in your favor of the 14th ultimo, I have to inform you that during the fourth quarter of 1879, seven hundred and forty

Chinese emigrants went from this port to the United States. Of this number six were women. During the first quarter 1880, there were eight hundred and forty-six male and twelve female emigrants.

I have, &c.,

J. S. MOSBY.

P. S.—Four hundred and fifty-eight males and one female went in the Gaelic on the 7th instant.

No. 12.

Mr. Seward to Mr. Evarts.

No. 735.] LEGATION OF THE UNITED STATES,
Peking, July 24, 1880. (Received September 15.)

I have the honor to transmit herewith a copy of a dispatch which has been received from the consul at Hong-Kong, showing the number of emigrants who left his port for the United States during the quarter ended June 30, 1880.

I have, &c.,

GEORGE F. SEWARD.

[Inclosure in No. 735.]

Mr. Mosby to Mr. Seward.

HONG-KONG, *July* 10, 1880.

SIR: In compliance with your request, I have the honor to inform you that during the quarter ending June 30, 1880, there were four thousand and ninety-one male, seven female, and forty-four boy emigrants from the port of Hong-Kong to the United States.

J. S. MOSBY,
United States Consul

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 176.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A communication from the Chief of Engineers, dated the 15th instant, and accompanying copy of report from Capt. William Ludlow, Corps of Engineers, upon an examination of Indian River, Delaware.

MAY 17, 1882.—Referred to the Committee on Commerce and ordered to be printed.

WAR DEPARTMENT,
Washington City, May 16, 1882.

The Secretary of War has the honor to transmit to the United States Senate, for the information of the Committee on Commerce, a communication from the Chief of Engineers, dated the 15th instant, and the accompanying copy of report from Capt. William Ludlow, Corps of Engineers, upon an examination of Indian River, Delaware, from its *mouth* to Millsborough, made in compliance with requirements in the river and harbor act of March 3, 1881.

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT *pro tempore*
of the United States Senate.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., May 15, 1882.

SIR: I have the honor to submit herewith a copy of a report to this office from Capt. William Ludlow, Corps of Engineers, of the results of an examination of Indian River, Delaware, from its mouth to Millsborough, made under his direction, to comply with requirements of the river and harbor act of March 3, 1881:

By direction of Brigadier-General Wright, and in his absence.

Very respectfully, your obedient servant,

JOHN G. PARKE,
Lieut. Col. of Engineers, Bt. Maj. Gen. U. S. A.

Hon. ROBERT T. LINCOLN,
Secretary of War.

EXAMINATION OF INDIAN RIVER, DELAWARE, FROM ITS MOUTH TO MILLSBOROUGH.

UNITED STATES ENGINEER OFFICE,
Philadelphia, Pa., April 29, 1882.

SIR: The following report on an examination of Indian River, Delaware, is submitted, in compliance with the requirements of the river and harbor act of March 3, 1881:

The Indian River and Rehoboth bays are fine sheets of water, having a combined expanse of about 20 square miles, separated from the ocean by a narrow sea beach, through which their common outlet discharges about 12 miles south of Cape Henlopen.

The navigation of the bays themselves, for the class of vessels trading to them, is comparatively unobstructed, that of Indian River Bay in particular being remarkable for its nearly uniform depth and freedom from shoals. In Indian River proper, which is the westward elongation of the bay, the navigation is well maintained nearly to Millsborough, with intervening shoals of no great extent.

It was at first inferred from the language of the act that an examination of Indian River only was intended, but a personal visit to the locality and communication with those interested in the navigation showed that the name "Indian River" is locally applied to the entire body of water between Millsborough and the sea, and that the most serious obstructions which it was sought to remove lay near the inlet at the junction of the two bays.

From such information as could be obtained and the records available, it appears that the entrance to Indian River is no exception to the rule that the shifting sands composing the sea beach deprive the inlet of stability in position, and that the general resultant of the forces in operation has caused a gradual movement northward.

The opening of the "ditches" described in the report of the assistant engineer, while not primarily the cause of this movement, have probably hastened it by impairing the concentration of flow necessary to the maintenance of the channel.

At the present time the inflow from the ocean encounters a nest of islands by which the currents are divided among several channels, with great loss of depth and tidal lift.

The main discharge from Indian River traverses the "ditches," and meets that from Rehoboth Bay upon the shoal north of Burton's Islands, known as "The Bulkhead," through which the channel depth is not over 2 feet at mean low water, with a rise of tide of a few inches only, and that dependent upon the prevailing winds.

An examination of the chart shows that it would no longer be expedient to re-establish and maintain the channel south of Burton's Islands, and the works proposed by the assistant engineer are calculated to fix the channel approximately in its present position, and to utilize favorably the scouring effect of the outflow from both bays. The estimates provide—

First. For the dredging of a channel 80 feet wide, and 4 feet deep, through "The Bulkhead," following the present line of deepest water.

Second. For a channel thence straight to the inlet, protecting this by means of a dike on its northern side through to the outer or sea beach.

Third. A >-shaped dike to bring the currents on each side of Burton's Islands into more regular confluence.

Of these "The Bulkhead" dredging and the dike through the sand-

bar and the beach are indispensable. The >-shaped dike at the eastern end of Burton's Islands may probably be omitted without serious disadvantage; and this remark is likewise true of the greater part of the dredging through the sand-flat between Burton's Islands and the entrance. Enough of this should be done to provide for the initial movement of the currents along the dike. The attainment of the full channel dimensions may be left to the subsequent scour of the currents.

The entire estimate is $50,000.

By the omission of the works above mentioned as those that may be dispensed with at the present time this estimate may be reduced to about $35,000 as the amount required to make a navigation of 4 feet at low water into Indian River and Rehoboth bays.

It is proper to say that were it in contemplation to establish the inlet in the position most favorable to its future depth and maintenance and to ease of navigation that shown in dotted lines on the chart, about 4,000 feet north of its present one, would be the most advantageous.

The cost, however, would be nearly double, owing to the largely-increased amount of dredging that would be required.

The report of the assistant engineer is accompanied by a chart, a table of physical data, and commercial statistics.

Very respectfully, your obedient servant,

WILLIAM LUDLOW,

Captain of Engineers, Bvt. Lt. Col. U. S. A.

The CHIEF OF ENGINEERS U. S. A.

REPORT OF MR. EDWIN LUDLOW, ASSISTANT ENGINEER.

UNITED STATES ENGINEER OFFICE,
Philadelphia, Pa., April 29, 1882.

SIR: I have the honor to submit the following report upon the examination of Indian River, Delaware.

Indian River Bay, with an average width of 1½ miles, extends 6 miles from the beach in a westerly direction, and there divides into two main "prongs" or branches. The principal one, called Indian River, bears a little northerly to Millsborough, 6 miles further. The other, after extending a mile southwest, divides into two branches, viz: Pepper Creek, reaching west-southwest 4½ miles to Dogsborough; and Vine's Creek, south to Frankford 4 miles.

Indian River Bay has a nearly uniform depth of from 6 to 8 feet almost from shore to shore, and vessels drawing 4 feet can ascend the Millsborough "prong" to within a mile of that town, and the Frankford "prong" to the various landings on Vine's and Pepper creeks 1 to 2 miles from their mouths, encountering, in either case, only a few mud flats of no serious importance.

White's Creek, flowing northward from Ocean View parallel to the coast, empties into Indian River Bay at its southeastern extremity, and is navigable for vessels of 4 feet draught to within a short distance of Ocean View, 5 miles from its junction with Indian River Bay.

In addition, there are numerous smaller creeks which, although not navigable for any distance, are still useful in furnishing good landing places for vessels trading to their vicinity.

Rehoboth Bay, adjoining Indian River Bay, to the north, is a sheet of water about 4 miles long by 2 wide, separated from the ocean by a low, narrow sand beach, and with two large creeks (Herring and Love's) flowing into it. Large sand flats stretch out from the eastern or beach side, caused by easterly storm tides sweeping across from the ocean and transporting the beach sand; but along the western shore a 6-foot channel leads from the head of the bay to a shoal called "The Bulkhead," near Burton's Islands, to be described later on.

About the year 1800, and before any charts had been made of this locality, the inlet, according to local information, was at the eastern extremity of Indian River Bay and nearly on the prolongation of its axis at a point about a mile and three quarters south of the present entrance. At that time what is now Burton's Islands was a peninsula joined to the main land by a narrow neck of marsh, and Rehoboth Bay discharged into Indian River Bay through a channel between the eastern end of this peninsula and the beach. The owner of the peninsula, in order to keep cattle from straying

dug two ditches through the neck, which have since continued to be known as the "big" and "little ditches."

The southwest wind, which prevails for several months in the year and has a sweep of 5 miles across Indian River Bay directly into these "ditches," caused the water to flow through them into Rehoboth Bay, from which it found its way to the inlet through the channel around the eastern end of Burton's Islands.

There are no data as to the character of the inlet at this time, but tradition states that previous to the opening of the "ditches" vessels drawing from 5 to 6 feet were able to get over the bar at the entrance and sail directly to the various landings on Indian River Bay and its tributaries without encountering any serious obstructions. Persons interested in the navigation agree in stating that from the opening of the "ditches" dates the beginning of the gradual working of the inlet to the north and the shoaling both of the bar at the entrance and of the inside channel.

The first reliable data that we have on this subject are from the chart of the United States Coast Survey made in 1843, giving the position of the inlet 1¼ miles north of its position in 1800 and one-half mile south of its present one.

The main channel at that time was on the south side of Burton's Islands, and had 3½ feet of water on its shoalest bar and on the bar at the entrance 1½ feet.

This would enable vessels drawing 4 feet to pass into Indian River Bay, taking advantage of high water and fair weather.

The field-work of the present survey was completed between March 8 and April 6, 1882, the weather being exceptionally boisterous and interfering greatly with progress.

In pursuance of your instructions my principal efforts were directed to the examination of the inlet and the location and character of the bars and shoals in its immediate vicinity.

For this purpose a base line of 3445½ feet was measured on the inner beach north of the inlet, and from it the principal points and stations on the neighboring shores and islands were determined by triangulation. The topography was sketched in by the aid of the sextant and the soundings were located by simultaneous observations with two sextants.

In addition a reconnaissance was made of Indian River to Millsborough, and of Rehoboth Bay to the mouth of Love's Creek.

In the reconnaissance the Coast-Survey chart of 1843 was taken as a basis for the general topography and the soundings were located by compass-bearings to such prominent natural objects as could be recognized on the chart.

The inlet in its present position is one-half mile north of its location in 1843, and has 2 feet at mean low water on its outer bar.

In traversing the beach the channel turns to the north and, making a deep bend, curves arouud again to a point opposite the entrance, where it divides into two branches. The one around the eastern and southern side of Burton's Islands is broad and shallow, while the other, passing to the north of Burton's Islands, and between them and Cedar Island, is now the main channel. Where confined between the two islands it is from 6 to 10 feet deep, but after leaving Cedar Island it enters the broad end of Rehoboth Bay, and the flood tide spreading loses its velocity and deposits the sand brought in from the ocean, forming what is known as "The Bulkhead," over which there are only about two feet at mean low water.

Owing to the shallowness of the channel south of Burton's Islands Indian River now discharges almost entirely through the two "ditches," which have so increased in size that the "big" or northern "ditch" is 350 feet wide and 15 feet deep, and the "little ditch" 400 feet wide and 8 feet deep.

The flow from Indian River meets the discharge from Rehoboth Bay near "The Bulkhead," and, together, they pass through the main or Cedar Island channel.

At the northeastern end of Burton's Islands this current is met nearly at right angles by the outflow around the southern and eastern sides, giving a deflection to the current that is the probable cause of the deep curvature into the north beach. These sinuosities have the effect of reducing the velocity and destroying the scouring force of the current.

The sea beach for a distance of 1,300 feet north from the inlet is only a low, narrow sand spit, bare at ordinary high water, but submerged during an easterly storm tide. Beyond, it rises into sand-dunes from 6 to 10 feet high.

The south beach rises almost immediately into sand-dunes of about the same height.

Bounding the channel to the southward, and between Burton's Islands and the entrance, is a large sand flat, bare at low water, but covered at half tide.

For the improvement of the entrance and the maintenance of an increased depth of water on the outer bar, it is necessary to give the ebb tide its maximum scouring force by means of a straight channel through the sand flat from the mouth of Cedar Island channel directly to the inlet.

For the preservation of this cut through the loose material of the shoal, and to control the northward movement of the inlet, a dike, marked B on the chart, will be required, having a total length, from the southeast end of Cedar Island to the south

point of the north beach, of 2,275 feet; and an extension of 200 feet thence to the 2-foot curve outside would be desirable.

Another (∧-shaped) dike, marked A, will be needed to bring the waters of Cedar and Burton's Islands channels together at a more favorable angle. It will have a total length, in the two arms, of 520 feet.

At present the most serious obstruction to navigation is "The Bulkhead," since, once across it, vessels can pass through the "ditches" to any part of Indian River and to the west shore of Rehoboth Bay.

Although the inlet is anything but "good," still vessels drawing 4½ feet cross the bar, owing to the greater rise of the tide; but, unless they reduce their draught to less than 3 feet, they will be unable to get over "The Bulkhead." This compels the larger vessels to load just inside the inlet, from lighters bringing freights down to them, a distance of 10 or 12 miles from the bay landings.

The smallest vessels trading to Indian River are now obliged to lighter over this shoal; while, if it were removed, they would be able to load at the various landings and sail directly for Philadelphia or New York.

The cost of freight is not only greatly increased by this rehandling, but also by the uncertainty as to the time; for vessels, during a range of low tides, have lain aground on "The Bulkhead" for as long as three weeks, and one week is about the average time consumed in getting over it. This renders it impossible to ship any perishable freight, such as fruit, vegetables, fish, or oysters.

The proposed improvement consists in dredging a channel 80 feet wide and 4 feet deep at mean low water along the present line of deepest water, to connect the 4-foot curves on each side of "The Bulkhead." The cut will be 3,000 feet long, and will require the removal of 14,800 cubic yards, at an estimated cost of 25 cents per yard.

The vessel owners attempted, about twenty-five years ago, to improve the navigation by closing, by means of dikes, all but the principal channel, which at that time was on the south side of Burton's Islands.

This afforded a temporary relief, but a heavy storm tide, about eighteen months later, swept the dikes away.

About six years ago a narrow channel was dredged through "The Bulkhead," which has since almost entirely filled up, for the reasons that it had not sufficient dimensions to maintain itself, and that the material removed, being placed on the open side of the cut, was carried back by the ebb tide from Rehoboth Bay.

TIDES.

The tides in Indian River and Rehoboth bays are extremely irregular and greatly affected by the wind.

The shallowness of the bar at the entrance, the numerous sand bars and shoals inside and the sinuous course of the channel, prevent the flood current from reaching more than about a mile from the inlet, and although there is a variation of level of from 6 inches to a foot as far as the heads of both bays, it bears almost no relation to the ocean tides, but is caused by the wind banking the water to leeward at one end or the other.

From the limited amount of both time and money allotted to the survey, no prolonged tidal observations could be made; but an examination of the records kept at the one tide-gauge established, gives, as a mean of twenty-six observations, a rise and fall of 1.04 feet, at a point about one-eighth of a mile inside the inlet.

During an easterly storm, driving the water into the inlet, and across the beach itself, the high water recorded 1.88, or 0.84 above mean high water. But, the storm continuing, the greatest high water was obtained two days later, when the wind, shifting to the west, and blowing hard, returned the water previously accumulated in the upper part of the bays, and gave a high water on the gauge of 2.28, or 1.24 above the average.

The low waters were affected by the wind in a similar manner. The highest low water was obtained after a light northeast wind on a flood tide had given a high water of 1.58 on the gauge. Shifting to the northwest on the ebb tide and blowing hard, the wind drove the water down the bays faster than it could be discharged, and gave a low water 0.88 above the average.

Westerly winds continuing for several days so reduced the level that the low water recorded 0.62 below the mean, and the flood current was represented by only a slight swelling on the gauge of from four-tenths to six-tenths of a foot.

A comparison was attempted between this gauge and the standard one on the government pier in the Breakwater Harbor, 16 miles north of the inlet. But the local causes just mentioned so largely affected the Indian River levels that no comparisons of any value could be made.

The rise and fall on the standard gauge at the breakwater is 4.06 feet, and this is useful as giving the probable rise and fall in the ocean outside of Indian River Bar.

Were the inlet fixed in position and of favorable depth, with a straight channel and no bars, a certain proportion of this rise and fall would be imparted to the surfaces of

Indian River and Rehoboth bays, and the mouths of their tributaries, a tidal area of about 20 square miles, and the scouring effect of the largely increased discharge would end to maintain a permanently improved depth of entrance.

Indian River and Rehoboth bays and their tributaries drain an area of about 225 square miles, over which an annual rainfall of about 38 inches may be assumed from the average given by the United States Signal Service for Philadelphia for the last six years.

Allowing 40 per cent. for absorption and evaporation, there will be an average of 32,635,000 cubic feet of fresh water draining into Indian River and Rehoboth bays daily. The current of these bodies of water being sluggish, the expanse considerable, and the depth comparatively small, there will be a large surface evaporation, which may be estimated at about 20 inches yearly, reducing the average daily fresh-water discharge through the inlet to about 30,000,000 cubic feet.

The average area affected by the tide is about 20 square miles. If a mean depth of the tidal prism of 3 inches were obtained, the total contents of the prism would be 139,392,000 cubic feet, and adding one-half the daily fresh-water supply, there would be an average discharge during one ebb-tide of 154,392,000 cubic feet.

Tabulating these results:

Drainage area	square miles..	225
Average annual rainfall assumed	inches..	38
Absorption and evaporation, 40 per cent	do....	15.2
Rainwater reaching the two bays	cubic feet..	11,918,016,000
Further evaporation over bays	do....	929,280,000
Annual fresh-water discharge	do....	10,988,736,000
Average daily fresh-water discharge	do....	30,000,000
Total contents tidal prism	do....	139,392,000
Total discharge in one ebb-tide	do....	154,392,000

Proportion of fresh to salt water, 1 to 9.

Assuming the average velocity of the ebb-tide to be three miles per hour, this discharge would maintain a channel 200 feet wide with a mean depth of 7 feet.

The channel to the inlet is estimated for a width of 150 feet and a mean depth of 5 feet; but it is only diked on the north side, the south shore being the sand bank over which the water can pass at half-tide. As this is composed of easily shifted sand, the force of the current will excavate it to the depth and width due to the scouring force.

Observations of the velocity of the ebb-tide make its present maximum four miles per hour, maintained for a variable length of time, depending on the wind.

Observations of the direction of the flood-tide were made on April 5, the weather being perfectly calm. Four floats were placed across the channel at the bottom of the curve into the north beach at 8.15 a. m., after the flood-tide had been running about half an hour. They all passed through Cedar Island channel, following the line of deepest water. On reaching "The Bulkhead" they spread out for a short distance, when being met, at 10.15 a. m., by the ebb-tide they were carried back. The distance traversed in the two hours is about one mile, giving an average velocity to the flood-tide of one-half mile per hour.

ESTIMATES.

Channel through "The Bulkhead" shoal:		
3,000 feet by 80 feet by 4 feet = 14,800 cubic yards, at 25 cents		$3,700
Channel to the inlet:		
2,000 feet by 150 feet by 5 feet = 46,400 cubic yards, at 25 cents		11,600
Dike A—A^1 300 feet.		
A^2 220 feet.		
Total A, 520 feet, at $8 per foot		4,160
Dike B—B^1, 1,100 feet, at $10	$11,000	
B^2, 1,170 feet, at $7.50	8,775	
B^3, 200 feet, at $25	5,000	
Total B		24,775
Engineering and contingencies		5,765
		50,000

Commercial statistics are appended.

Respectfully submitted,

EDWIN LUDLOW,
Assistant Engineer.

Col. WM. LUDLOW,
Captain Corps of Engineers, U. S. A.

Tidal observations at gauge one-eighth mile inside Indian River Inlet, Delaware, March 11 *to April* 6, 1882.

	Feet.	Decimals.	Hours.	Minutes.
Mean low water	0	00	.....	.....
Mean low water stand on gauge	.....	.....	1	12
Mean high water	1	04	.....	.....
Mean high water stand on gauge	.....	.....	0	25
Mean rise and fall	1	04	.....	.....
Maximum high water	2	28	.....	.....
Minimum low water	0	62	.....	.....
Maximum variation of tide	2	90	.....	.....
Mean duration of rise	.....	.....	5	09
Mean duration of fall	.....	.....	5	52
Mean duration of flood	.....	.....	2	15
Mean duration of ebb	.....	.....	8	00
Maximum velocity of ebb, 4 miles per hour.				
Mean velocity of flood, one-half mile per hour.				

COMMERCIAL STATISTICS INDIAN RIVER, DELAWARE.

There are owned in Indian River and vicinity eight schooners, of from 10 to 40 tons burden, which make from ten to twenty trips annually, exporting lumber, grain, cord-wood, and railroad ties, and importing lime, coal, bricks, and general merchandise.

In addition, from twenty to thirty trips are made annually by vessels owned elsewhere, which come here for lumber and wood.

The prospective commerce of this river cannot be determined from its present statistics, as the most valuable products of this region are the fruits, vegetables, and oysters, whose perishable nature prevents their being shipped by water, while so much uncertainty exists as to the time required to get to sea.

There are now fifty saw-mills in active operation along the banks of Indian River and its tributaries, whose daily output is from 1,200 to 5,000 feet of lumber each. Averaging the products, gives 54,000,000 feet of lumber yearly, which, at an average value of $17.50 per 1,000, makes $945,000 worth of lumber annually exported from this region.

Owing to the obstructions to the navigation but a small proportion of this is now shipped by water, the greater part being hauled from 1 to 15 miles to the nearest railroad station.

Were the navigation so improved that vessels of sufficient draught, say 5 or 6 feet, could reach the various landings on the river, almost the entire amount of lumber sawed would be shipped by water, owing to the cheaper freight and the diminished carting distance.

The numerous granaries still standing at the various landings show how large was the water export of grain when Indian River had an unobstructed navigation.

Owing to the fact that almost every boat trading here has its own landing and shipper, accurate statistics could not be obtained in the limited time available. But Mr. R. F. Hastings, of Millsborough, who has examined the matter, states that while the present commerce by water is not worth more than $100,000 per year, were the navigation improved it would amount to at least $1,000,000.

EDWIN LUDLOW,
Assistant Engineer.

47TH CONGRESS, 1st Session. } SENATE. { Ex. DOC. No. 177.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

An accession of the United States to the convention concluded at Geneva on the 22d August, 1864. between various powers, for the amelioration of the wounded of armies in the field, and to the additional articles thereto, signed at Geneva on the 20th October, 1868.

MARCH 3, 1882.—Read; accession read the first time, referred to the Committee on Foreign Relations, and, together with the message, ordered to be printed in confidence for the use of the Senate.
MARCH 16, 1882.—Ratified and injunction of secrecy removed therefrom.

To the Senate of the United States:

I transmit to the Senate for its action thereon the accession of the United States to the convention concluded at Geneva on the 22d August, 1864, between various powers, for the amelioration of the wounded of armies in the field, and to the additional articles thereto, signed at Geneva on the 20th October, 1868.

CHESTER. A. ARTHUR.

WASHINGTON, *March* 3, 1882.

Whereas, on the 22d day of August, 1864, a convention was concluded at Geneva, in Switzerland, between the Grand Duchy of Baden and the Swiss Confederation, the Kingdom of Belgium, the Kingdom of Denmark, the Kingdom of Spain, the French Empire, the Grand Duchy of Hesse, the Kingdom of Italy, the Kingdom of the Netherlands, the Kingdom of Portugal, the Kingdom of Prussia, and the Kingdom of Wiirtemberg, for the amelioration of the wounded in armies in the field, the tenor of which convention is as follows:

The Swiss Confederation; His Royal Highness the Grand Duke of Baden; His Majesty the King of the Belgians; His Majesty the King of Denmark; Her Majesty the Queen of Spain; His Majesty the Emperor of the French; His Royal Highness the Grand-Duke of Hesse; His Majesty the King of Italy; His Majesty the King of the Netherlands; His Majesty the King of Portugal and of the Algarves; His Majesty the King of Prussia; His Majesty the King of Wiirtemberg, being equally animated with the desire to soften, as much as depends on them, the evils of warfare, to suppress its useless hardships and improve the fate of wounded soldiers on the field of battle, have resolved to conclude a convention to that effect, and have named for their plenipotentiaries, viz:

The Swiss Confederation:

GUILLAUME HENRI DUFOUR, Grand Officer of the Imperial Order of the Legion of Honor, General in Chief of the federal army, Member of the Council of the States;

GUSTAVE MOYNIER, President of the International Relief Committee for wounded soldiers and of the Geneva Society of Public Utility, and

SAMUEL LEHMANN, federal Colonel, Doctor in Chief of the federal army, Member of the National Council;

His Royal Highness the Grand-Duke of Baden:

ROBERT VOTZ, Knight of the Order of the Lion of Zaehringen, M. D., Medical Councillor at the Direction of Medical Affairs, and

ADOLPHE STEINER, Knight of the Order of the Lion of Zaehringen, Chief Staff Physician;

His Majesty the King of the Belgians:

AUGUSTE VISSCHERS, Officer of the Order of Leopold, Councillor at the Council of Mines;

His Majesty the King of Denmark:

CHARLES EMILE FENGER, Commander of the Order of Danebrog, decorated with the silver cross of the same Order; Grand Cross of the Order of Leopold of Belgium, &c., &c., His Councillor of State;

Her Majesty the Queen of Spain:

Don JOSÉ HERIBERTO GARCÍA DE QUEVEDO, Gentleman of Her Chamber on active service, Knight of the Grand Cross of Isabella-the-Catholic, Numerary Commander of the Order of Charles III, Knight of the first class of the Royal and Military Order of St. Ferdinand, Officer of the Legion of Honor of France, Her Minister-Resident to the Swiss Confederation;

His Majesty the Emperor of the French:

GEORGES CHARLES JAGERSCHMIDT, Officer of the Imperial Order of the Legion of Honor, Officer of the Order of Leopold of Belgium, Knight of the Order of the Red Eagle of Prussia of the third class, &c., &c., Sub-Director at the Ministry of Foreign Affairs;

HENRI EUGÈNE SEGUINEAU DE PRÉVAL, Knight of the Imperial Order of the Legion of Honor, decorated with the Imperial Order of the Medjidié of fourth class, Knight of the Order of Saints Maurice and Lazarus of Italy, &c., &c., military Sub-Commissioner of first class, and

MARTIN FRANÇOIS BOUDIER, Officer of the Imperial Order of the Legion of Honor, decorated with the Imperial Order of the Medjidié of the fourth class, decorated with the medal of Military Valor of Italy, &c., &c., doctor in chief of second class;

His Royal Highness the Grand Duke of Hesse:

CHARLES AUGUSTE BRODRÜCK, Knight of the Order of Philip the Magnanimous, of the Order of St. Michael of Bavaria, Officer of the Royal Order of the Holy Savior, &c., &c., Chief of Battalion, Staff Officer;

His Majesty the King of Italy:

JEAN CAPELLO, Knight of the Order of Saints Maurice and Lazarus, His Consul-General to Switzerland, and

FELIX BAROFFIO, Knight of the Order of Saints Maurice and Lazarus, Doctor in Chief of medical division;

His Majesty the King of the Netherlands:

BERNARD ORTUINUS THEODORE HENRI WESTENBERG, Officer of His Order of the Crown of Oak, Knight of the Orders of Charles III of Spain, of the Crown of Prussia, of Adolphe of Nassau, L. D., His Secretary of Legation at Frankfort;

His Majesty the King of Portugal and of the Algarves:

JOSÉ ANTONIO MARQUES, Knight of the Order of Christ, of Our Lady of the Conception of Villa Viciosa, of Saint Benedict of Aviz, of Leopold of Belgium, etc., M. D. Surgeon of Brigade, Sub-Chief to the Department of Health at the Ministry of War;

His Majesty the King of Prussia:

CHARLES ALBERT DE KAMPTZ, Knight of the Order of the Red Eagle of second class, &c., &c., &c., His Envoy Extraordinary and Minister Plenipotentiary to the Swiss Confederation, Private Councillor of Legation;

GODEFROI FREDERIC FRANÇOIS LOEFFLER, Knight of the Order of the Red Eagle of third class, etc., etc.; M. D. Physician in Chief of the fourth Army Corps;

GORGES HERMANN JULES RITTER, Knight of the Order of the Crown of third class, etc., etc., Private Councillor at the Ministry of War;

His Majesty the King of Würtemberg:

CHRISTOPHE ULRIC HAHN, Knight of the Order of Saints Maurice and Lazarus, etc., Doctor of Philosophy and Theology, Member of the Central Royal Direction for Charitable Institutions,

Who, after having exchanged their powers, and found them in good and due form, agreed to the following articles:

ARTICLE I. Ambulances and military hospitals shall be acknowledged to be neuter, and, as such, shall be protected and respected by belligerents so long as any sick or wounded may be therein.

Such neutrality shall cease if the ambulances or hospitals should be held by a military force.

ART. II. Persons employed in hospitals and ambulances, comprising the staff for superintendence, medical service, administration, transport of wounded, as well as chaplains, shall participate in the benefit of neutrality, whilst so employed, and so long as there remain any wounded to bring in or to succor.

ART. III. The persons designated in the preceding article may, even after occupation by the enemy, continue to fulfill their duties in the hospital or ambulance which they serve, or may withdraw in order to rejoin the corps to which they belong.

Under such circumstances, when these persons shall cease from their functions, they shall be delivered by the occupying army to the outposts of the enemy.

ART. IV. As the equipment of military hospitals remains subject to the laws of war, persons attached to such hospitals cannot, in withdrawing, carry away any articles but such as are their private property.

Under the same circumstances an ambulance shall, on the contrary, retain its equipment.

ART. V. Inhabitants of the country who may bring help to the wounded shall be respected, and shall remain free. The generals of the belligerent Powers shall make it their care to inform the inhabitants of the appeal addressed to their humanity, and of the neutrality which will be the consequence of it.

Any wounded man entertained and taken care of in a house shall be considered as a protection thereto. Any inhabitant who shall have entertained wounded men in his house shall be exempted from the quartering of troops, as well as from a part of the contributions of war which may be imposed.

ART. VI. Wounded or sick soldiers shall be entertained and taken care of, to whatever nation they may belong.

Commanders-in-chief shall have the power to deliver immediately to the outposts of the enemy soldiers who have been wounded in an engagement, when circumstances permit this to be done, and with the consent of both parties.

Those who are recognized, after their wounds are healed, as incapable of serving, shall be sent back to their country.

The others may also be sent back, on condition of not again bearing arms during the continuance of the war.

Evacuations, together with the persons under whose directions they take place, shall be protected by an absolute neutrality.

ART. VII. A distinctive and uniform flag shall be adopted for hospitals, ambulances, and evacuations. It must, on every occasion, be accompanied by the national flag. An arm-badge (brassard) shall also be allowed for individuals neutralized, but the delivery thereof shall be left to military authority.

The flag and the arm-badge shall bear a red cross on a white ground.

ART. VIII. The details of execution of the present convention shall be regulated by the commanders-in-chief of belligerent armies, according to the instructions of their respective governments, and in conformity with the general principles laid down in this convention.

ART. IX. The high contracting Powers have agreed to communicate the present convention to those Governments which have not found it convenient to send plenipotentiaries to the International Conference at Geneva, with an invitation to accede thereto; the protocol is for that purpose left open.

ART. X. The present convention shall be ratified, and the ratifications shall be exchanged at Berne in four months, or sooner, if possible.

In faith whereof the respective Plenipotentiaries have signed it and have affixed their seals thereto.

Done at Geneva, the twenty-second day of the month of August, of the year one thousand eight hundred and sixty-four.

[L. S.] G'l G. H. DUFOUR.
[L. S.] G. MOYNIER.
[L. S.] Dr. LEHMANN.
[L. S.] Dr. ROBERT VOLZ.
[L. S.] STEINER.
[L. S.] VISSCHERS.
[L. S.] FENGER.
[L. .S] Y. HERIBERTO GARCÍA DE QUEVEDO.
[L. S.] CH. JAGERSCHMIDT.
[L. S.] S. DE PRÉVAL.
[L. S.] BOUDIER.
[L. S.] BRODRÜCK.
[L. S.] CAPELLO.
[L. S.] F. BAROFFIO.
[L. S.] WESTENBERG.
[L. S.] JOSÉ ANTONIO MARQUES.
[L. S.] DE KAMPTZ.
[L. S.] LOEFFLER.
[L. S.] RITTER.
[L. S.] Dr. HAHN.

And whereas the several contracting parties to the said Convention exchanged the ratifications thereof at Geneva on the 22d day of June, 1865;

And whereas the several states hereinafter named have adhered to the said Convention in virtue of Article IX thereof, to wit:

Sweden	December 13, 1864.
Greece	January 5–17, 1865.
Great Britain	February 18, 1865.
Mecklenburg-Schwerin	March 9, 1865.
Turkey	July 5, 1865.
Wiirtemberg	June 2, 1866.
Hesse	June 22, 1866.
Bavaria	June 30, 1866.
Austria	July 21, 1866.
Persia	December 5, 1874.
Salvador	December 30, 1874.
Montenegro	November 17–29, 1875.
Servia	March 24, 1876.
Bolivia	October 16, 1879.
Chili	November 15, 1879.
Argentine Republic	November 25, 1879.
Peru	April 22, 1880.

And whereas the Swiss Confederation, in virtue of the said Article IX of said Convention, has invited the United States of America to accede thereto.

And whereas on the 20th October, 1868, the following additional articles were proposed and signed at Geneva, on behalf of Great Britain, Austria, Baden, Bavaria, Belgium, Denmark, France, Italy, Netherlands, North Germany, Sweden and Norway, Switzerland, Turkey, and Wiirtemberg:

The governments of North Germany, Austria, Baden, Bavaria, Belgium, Denmark, France, Great Britain, Italy, the Netherlands, Sweden and Norway, Switzerland, Turkey, and Wiirtemberg, desiring to extend to armies on the sea the advantages of the Convention concluded at Geneva the 22d of August, 1864, for the amelioration of the condition of wounded soldiers in armies in the field, and to further particularize some of the stipulations of the said Convention, have named for their commissioners:

1. *North Germany:*

HENRI DE ROEDER, Lieutenant-General, Envoy Extraordinary and Minister Plenipotentiary of His Majesty the King of Prussia and of the North Germanic Confederation to the Swiss Confederation, Knight of the Red Eagle second class, etc., etc.

FREDERIC LOEFFLER, Physician in Chief of the Army, Professor of Military Medicine, Knight of the Order of the Crown, second class, with crossed swords, etc., etc.

HENRY KÖHLER, Naval Captain, Chief of Division at the Ministry of the Navy, Knight of the Order of the Crown, third class, etc.

2. *Austria:*

Dr. JAROMIR, Baron MUNDY, Staff Physician of first class, Commander of the Order of His Majesty Emperor Francis Joseph of Austria, King of Hungary.

3. *Baden:*

ADOLPHE STEINER, Chief Staff Physician, Knight of the first class of the order of the Lion Zaehringen, with oak-leaf.

4. *Bavaria:*

THEODORE DOMPIERRE, Chief Physician of first class, Knight of the order of St. Michael.

5. *Belgium:*

AUGUST VISSCHERS, Councillor of the Council of Mines of Belgium, Officer of the Order of Leopold.

6. *Denmark:*

JOHN BARTHÉLEMY GAÏFRE GALIFFE, L. D., Consul of His Majesty the King of Denmark to the Swiss Confederation, Knight of the order of Danebrog and of the order of Saints Maurice and Lazarus

7. *France:*

AUGUST COUPVENT DES BOIS, Rear-Admiral, Commander of the imperial order of the Legion of Honor, etc., etc.

HENRY EUGÈNE SEGUINEAU DE PRÉVAL, military subcommissioner of first class, officer of the imperial order of the Legion of Honor, etc., etc.

8. *Great Britain:*

JOHN SAVILLE LUMLEY, Envoy Extraordinary and Minister Plenipotentiary of Her Britannic Majesty to the Swiss Confederation.

HASTINGS REGINALD YELVERTON, Rear-Admiral in the service of Her Britannic Majesty, Companion of the Order of the Bath.

9. *Italy:*

FELIX BAROFFIO, Physician in Chief, Knight of the Order of Saints Maurice and Lazarus, of the order of the Crown of Italy.

PAUL COTTRAU, Captain of frigate, Knight of the order of Saints Maurice and Lazarus, decorated with the silver medal of military Valor.

10. *The Netherlands:*

YONKEER HERMANN ADRIEN VAN KARNEBECK, Vice-Admiral, Aide-de-camp extraordinary to His Majesty the King of the Netherlands, decorated with the civil and military orders and the crosses and medals of 1815, of 1830 of the Netherlands, and of the campaigns of Yava, Grand Cross of the military orders of Christ and of Tunis, grand officer of the order of Charles the Third of Spain, Commander of the orders of St. Anne of Russia, in diamonds, of Leopold of Belgium and of the Falcon of Saxe-Weimar, Knight of the Legion of Honor, decorated with the medal of St. Helena.

BERNARD ORTUINUS THEODORE HENRI WESTENBERG, L. D. Councillor, of Legation of His Majesty the King of the Netherlands, Commander of the Oaken Crown, Grand Commander of the order of St. Michael of Bavaria, Knight of the orders of Charles III of Spain, of the Crown of Prussia, of Danebrog, of Denmark, and of Adolphe of Nassau.

11. *Sweden and Norway:*

FERDINAND NATHANIEL STAAF, Lieutenant Colonel, military attaché of the Legation of Sweden and Norway in Paris, Knight of the Royal Orders of the Sword of Sweden and of Saint Olaf of Norway, officer of the imperial order of the Legion of Honor, as well of Public Instruction in France, Knight of the imperial order of the Iron Crown of Austria, etc., etc.

12. *Switzerland:*

GUILLAUME HENRI DUFOUR, ex-general in chief of the federal army, Grand Cross of the Legion of Honor.

GUSTAVE MOYNIER, President of the International Committee for the relief of the wounded, officer of the order of Saints Maurice and Lazarus, Knight of first class of the Order the Lion of Zachringen, Knight of the Orders of the Polar Star and of Our Lady of the Conception of Villa-Visçosa, etc., etc.

SAMUEL LEHMANN, Federal Colonel, physician in chief of the federal army, member of the National Council.

13. *Turkey:*

HUSNY EFFENDI, Major, military attaché of Turkey to Paris, decorated with the imperial order of Medjidié of the fifth class.

14. *Würtemberg:*

CHRISTOPHE HAHN, Doctor of philosophy and theology, member of the central direction for charitable institutions, President of the committee from Wiirtemberg for the wounded, Knight of the Order of Frederic and of Saints Maurice and Lazarus.

EDOUARD FICHTE, M. D., physician in chief of the army of Wiirtemberg and the Order of the Crown of Prussia, of third class;

Who, having been duly authorized to that effect, agreed, under reserve of approbation from their governments, to the following dispositions:

ARTICLE I. The persons designated in Article II of the Convention shall, after the occupation by the enemy, continue to fulfil their duties, according to their wants, to the sick and wounded in the ambulance or the hospital which they serve. When they request to withdraw, the commander of the occupying troops shall fix the time of departure, which he shall only be allowed to delay for a short time in case of military necessity.

ART. II. Arrangements will have to be made by the belligerent powers to ensure to the neutralized person, fallen into the hands of the army of the enemy, the entire enjoyment of his salary.

ART. III. Under the conditions provided for in Articles I and IV of the Convention,

the name "ambulance" applies to field hospitals and other temporary establishments, which follow the troops on the field of battle to receive the sick and wounded.

ART. IV. In conformity with the spirit of Article V of the Convention, and to the reservations contained in the protocol of 1864, it is explained that for the appointment of the charges relative to the quartering of troops, and of the contributions of war, account only shall be taken in an equitable manner of the charitable zeal displayed by the inhabitants.

ART. V. In addition to Article VI of the Convention, it is stipulated that, with the reservation of officers whose detention might be important to the fate of arms and within the limits fixed by the second paragraph of that article, the wounded fallen into the hands of the enemy shall be sent back to their country, after they are cured, or sooner if possible, on condition, nevertheless, of not again bearing arms during the continuance of the war.

ART. VI. The boats which, at their own risk and peril, during and after an engagement pick up the shipwrecked or wounded, or which having picked them up, convey them on board a neutral or hospital ship, shall enjoy, until the accomplishment of their mission, the character of neutrality, as far as the circumstances of the engagement and the position of the ships engaged will permit.

The appreciation of these circumstances is entrusted to the humanity of all the combatants. The wrecked and wounded thus picked up and saved must not serve again during the continuance of the war.

ART. VII. The religious, medical, and hospital staff of any captured vessel are declared neutral. and, on leaving the ship, may remove the articles and surgical instruments which are their private property.

ART. VIII. The staff designated in the preceding article must continue to fulfil their functions in the captured ship, assisting in the removal of wounded made by the victorious party; they will then be at liberty to return to their country, in conformity with the second paragraph of the first additional article.

The stipulations of the second additional article are applicable to the pay and allowance of the staff.

ART. IX. The military hospital ships remain under martial law in all that concerns their stores; they become the property of the captor, but the latter must not divert them from their special appropriation during the continuance of the war.

The vessels not equipped for fighting, which, during peace, the government shall have officially declared to be intended to serve as floating hospital ships, shall, however, enjoy during the war complete neutrality, both as regards stores, and also as regards their staff, provided their equipment is exclusively appropriated to the special service on which they are employed.

ART. X. Any merchantman, to whatever nation she may belong, charged exclusively with removal of sick and wounded, is protected by neutrality, but the mere fact, noted on the ship's books, of the vessel having been visited by an enemy's cruiser, renders the sick and wounded incapable of serving during the continuance of the war. The cruiser shall even have the right of putting on board an officer in order to accompany the convoy, and thus verify the good faith of the operation.

If the merchant ship also carries a cargo, her neutrality will still protect it, provided that such cargo is not of a nature to be confiscated by the belligerents.

The belligerents retain the right to interdict neutralized vessels from all communication, and from any course which they may deem prejudicial to the secrecy of their operations. In urgent cases special conventions may be entered into between commanders-in-chief, in order to neutralize temporarily and in a special manner the vessels intended for the removal of the sick and wounded.

ART. XI. Wounded or sick sailors and soldiers, when embarked, to whatever nation they may belong, shall be protected and taken care of by their captors.

Their return to their own country is subject to the provisions of Article VI of the Convention, and of the additional Article V.

ART. XII. The distinctive flag to be used with the national flag, in order to indicate any vessel or boat which may claim the benefits of neutrality, in virtue of the principles of this Convention, is a white flag with a red cross. The belligerents may exercise in this respect any mode of verification which they may deem necessary.

Military hospital ships shall be distinguished by being painted white outside, with green strake.

ART. XIII. The hospital ships which are equipped at the expense of the aid societies, recognized by the governments signing this Convention, and which are furnished with a commission emanating from the sovereign, who shall have given express authority for their being fitted out, and with a certificate from the proper naval authority that they have been placed under his control during their fitting out and on their final departure, and that they were then appropriated solely to the purpose of their mission, shall be considered neutral, as well as the whole of their staff. They shall be recognized and protected by the belligerents.

They shall make themselves known by hoisting, together with their national flag,

the white flag with a red cross. The distinctive mark of their staff, while performing their duties, shall be an armlet of the same colors.

The outer painting of these hospital ships shall be white, with red strake.

These ships shall bear aid and assistance to the wounded and wrecked belligerents, without distinction of nationality.

They must take care not to interfere in any way with the movements of the combatants. During and after the battle they must do their duty at their own risk and peril.

The belligerents shall have the right of controlling and visiting them; they will be at liberty to refuse their assistance, to order them to depart, and to detain them if the exigencies of the case require such a step.

The wounded and wrecked picked up by these ships cannot be reclaimed by either of the combatants, and they will be required not to serve during the continuance of the war.

ART. XIV. In naval wars any strong presumption that either belligerent takes advantage of the benefits of neutrality, with any other view than the interest of the sick and wounded, gives to the other belligerent, until proof to the contrary, the right of suspending the Convention, as regards such belligerent.

Should this presumption become a certainty, notice may be given to such belligerent that the Convention is suspended with regard to him during the whole continuance of the war.

ART. XV. The present Act shall be drawn up in a single original copy, which shall be deposited in the Archives of the Swiss Confederation.

An authentic copy of this Act shall be delivered, with an invitation to adhere to it, to each of the signatory Powers of the Convention of the 22d of August, 1864, as well as to those that have successively acceded to it.

In faith whereof, the undersigned commissaries have drawn up the present project of additional articles and have apposed thereunto the seals of their arms.

VON ROEDER.
F. LÖFFLER.
KÖHLER.
DR. MUNDY.
STEINER.
DR. DOMPIERRE.
VISSCHERS.
J. B. G. GALIFFE.
D. FELICE BAROFFIO.
PAOLO COTTRAU.
H. A. VAN KARNEBECK.
WESTENBERG.
F. N. STAAFF.
G. H. DUFOUR.
G. MOYNIER.
A. COUPVENT DES BOIS.
H. DE PRÉVAL.
JOHN SAVILLE LUMLEY.
H. R. YELVERTON.
DR. S. LEHMANN.
HUSNY.
DR. C. HAHN.
DR. FICHTE.

Now therefore,

The President of the United States of America, by and with the advice and consent of the Senate, hereby declares that the United States accede to the said Convention of the 22d August, 1864, and also accede to the said Convention of October 20, 1868.

Done at Washington this first day of March in the year of our Lord one thousand eight hundred and eighty-two, and of the Independence of the United States the one hundred and sixth.

[SEAL.]

CHESTER A. ARTHUR.

By the PRESIDENT.

FRED'K T. FRELINGHUYSEN,
Secretary of State.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 178.

REPORT

OF

THE BOARD

ON

HEAVY ORDNANCE AND PROJECTILES

APPOINTED IN CONFORMITY WITH

THE ACT OF CONGRESS APPROVED MARCH 3, 1881,

BY

GENERAL ORDERS, No. 48, A. G. O., MAY 16, 1881,

FOR THE PURPOSE OF

"MAKING EXAMINATIONS OF ALL INVENTIONS OF HEAVY ORDNANCE AND IMPROVEMENTS OF HEAVY ORDNANCE AND PROJECTILES; AND MAKING A DETAILED REPORT, TO THE SECRETARY OF WAR FOR TRANSMISSION TO CONGRESS, OF SUCH EXAMINATIONS WITH RECOMMENDATION AS TO WHAT INVENTIONS ARE WORTHY OF ACTUAL TEST AND THE ESTIMATED COST OF SUCH TEST."

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1882.

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ERRATA.

Page 4, section II, line 6: for S. C. Cobb read *L. C. Cobb.*
Page 5, section III, line 5: for A. Shroeder read *A. Schroeder.*
Page 8, paragraph 21, line 1: for 12-inches read 12-*inch.*
Page 31, line 14: for N. Y. Mayer read *A. Y. Mayer.*
Page 36, line 15: for M. Stafford read *N. Stafford.*
Fifth line from bottom of page 26: for N. G. Safford read *A. G. Safford.*
Fifth line from bottom of page 171: for 31.+ read 8.+.
Eighth line from bottom of page 219: for F. S. read *F. E.*

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 178.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

The report of the Board appointed under the act of Congress of March 3, 1881, to make examinations of inventions of heavy ordnance and improvements of heavy ordnance and projectiles, and to recommend what inventions are worthy of actual test, &c.

MAY 29, 1882.—Ordered to lie on the table.
MAY 31, 1882.—Referred to the Committee on Appropriations and ordered to be printed.

WAR DEPARTMENT,
Washington City, May 29, 1882.

The Secretary of War has the honor to transmit to the Senate the report of the Board selected by the President under the authority of the act of Congress approved March 3, 1881, "to make examinations of all inventions of heavy ordnance and improvements of heavy ordnance and projectiles that may be presented to them, including guns now being constructed or converted under the direction of the Ordnance Bureau," and to recommend "what inventions are worthy of actual test, and the estimated cost of such test."

In the communication of the president of the Board transmitting the report of the Board to the War Department, it is stated that certain "accompanying documents referred to in a note to the report, which are very numerous, will be forwarded in a short time, as soon as they can be prepared." They have not yet been received at this department. The documents referred to will be comprised in appendices numbered III, IV, V, and VI, and their character is briefly indicated in a note attached to the report of the Board.

These documents will be transmitted to the Senate as soon as they shall be received at the War Department.

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT *pro tempore, United States Senate.*

REPORT

OF

THE BOARD ON HEAVY ORDNANCE AND PROJECTILES

APPOINTED IN PURSUANCE OF

The act of Congress approved March 3, 1881, *for the purpose of "making examinations of all inventions of heavy ordnance and improvements of heavy ordnance and projectiles that may be presented to them, including guns now being constructed or converted under direction of the Ordnance Bureau."*

OFFICE OF THE BOARD ON HEAVY ORDNANCE
AND PROJECTILES, ARMY BUILDING,
GREENE AND HOUSTON STREETS,
New York City, May 18, 1882.

The Board met at this place on the 13th day of July, 1881, in compliance with the following order:

{ GENERAL ORDERS } { No. 48. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, May 16, 1881.

The following order from the War Department is published for the information of all concerned:

"The act making appropriations for fortifications and other works of defense, and for the armament thereof, for the fiscal year ending June 30, 1882, and for other purposes," approved March 3, 1881, provides:

"And the President is authorized to select a Board, to consist of one Engineer officer, two Ordnance officers, and two officers of Artillery, whose duty it shall be to make examinations of all inventions of heavy ordnance and improvements of heavy ordnance and projectiles that may be presented to them, including guns now being constructed or converted under direction of the Ordnance Bureau; and said Board shall make detailed report to the Secretary of War, for transmission to Congress, of such examination, with recommendation as to what inventions are worthy of actual test, and the estimated cost of such test; and the sum of $25,000, or so much thereof as may be necesary, is hereby appropriated for such purpose."

In conformity with the foregoing act a board of officers will assemble at the Army Building, New York City, on the 13th day of July, 1881, for the purpose of making examinations of all inventions referred to in the law, and making a detailed report of such examinations, with recommendation as to what inventions are worthy of actual test, and the estimated cost of such test.

Detail for the Board.—Brevet Major-General George W. Getty, colonel Third Artillery.

Colonel Z. B. Tower, Corps of Engineers.
Colonel J. G. Benton, Ordnance Department.
Major A. R. Buffington, Ordnance Department.
Major John Mendenhall, First Artillery.

Second Lieut. Frank E. Hobbs, Second Artillery, will report to the president of the Board for duty as recorder.

The Chief of Ordnance will furnish the Board with all the information on the subject in his possession; and all persons interested in such inventions, are invited to submit to the Board plans, specifications, and models, mode of construction, cost, &c.

By command of General Sherman.

R. C. DRUM,
Adjutant-General.

Official:
H. C. CORBIN,
Assistant Adjutant-General.

Colonel J. G. Benton, Ordnance Department, died August 23, 1881, and Major F. H. Parker, Ordnance Department, was detailed as a member of the Board by the following order:

{ SPECIAL ORDERS { No. 220. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, September 29, 1881.

[Extract.]

* * * * * * *

2. By direction of the President, Major F. H. Parker, Ordnance Department, is detailed as a member of the Board on Heavy Ordnance convened by General Orders, No. 48, May 16, 1881, from this office, and will report for duty accordingly.

* * * * * * *

By command of General Sherman:

CHAUNCY McKEEVER,
Acting Adjutant-General.

Official:
H. C. CORBIN,
Assistant Adjutant-General.

The Board has continued in session, at intervals, until this date, and carefully examined and considered all inventions of heavy ordnance and improvements of heavy ordnance and projectiles presented to them, including guns now being constructed or converted under direction of the Ordnance Bureau.

These inventions and improvements have been introduced to the attention of the Board by original letters, drawings, specifications, letters-patent and models, from the inventors, from the files of the Ordnance Department, and by communications from that department.

In regard to each and all of which the Board respectfully reports the following action, opinions, and recommendations, viz:

I. The following designs are regarded as *entirely impracticable*, and hence are *not recommended* for actual test:

Design for—	Submitted by—	For action, see page of proceedings No.—
Oblong shell	W. H. Cleland	31
Heavy shot	S. Cleveland	31
Projectile	E. J. Couch	31
Ordnance inventions	C. B. Guy	32
Projectile	T. N. Hornsby	37
Exhausting air from bore of gun	C. B. Barrows	60

II. The following designs are *not* regarded as *having sufficient merit to warrant a trial*, and hence are *not recommended* for actual test:

Design for—	Submitted by—	For action, see page of proceedings No.—
Gnn and fortification	Jno. Robbins	26
Guns and projectile	Jos. Harris	26
B. L. ordnance	S. C. Cobb	27
Projectile	E. L. Birchard	28
Gun construction	J. R. Tillett	30
Gun construction	Jno. Groves	30
Cannon and projectile	J. T. Jeter	32
B. L. ordnance	Theo. Yates	36
Giving rotary motion to projectiles fired from smooth-bore guns.	N. Stafford	36
Projectile	C. Roosevelt	49
Projectiles	Dr. J. H. McLean	56

III. The following designs are *not* regarded as *within the scope of the board's investigations*, and hence are *not recommended* for actual test:

Design for—	Submitted by—	For action, see page of proceedings No. —
Machine gun	Jno. McNulty	26
Gun construction	A. Shroeder	26
Projectile	C. J. O'Hara	28
Artillery shell	R. M. Parker	28
Revolving cannon	J. W. Potter	29
Projectile	G. W. Turner	29
Segment shell	H. Studer	30
Projectile	A. Y. Mayer	31
Shell	A. Newport	32
Lifting machine	H. H. Sibley	35
Life preserving rolling ship	F. M. Shields	45
Powder bags	H. Reilly	46
Segment shell	R. Woodward	47
Elevating and depressing apparatus	A. F. Potter	28
Glass bombshell	Eastland and Bonshire	72
Claim for priority of invention of air chambers	H. Caudwell	26

IV. The following designs are *not* thought *suitable for guns of large caliber*, and hence are *not recommended* for actual test:

Design for—	Submitted by—	For action, see page of proceedings No. —
Gun construction and carriage	Jos. Bolt	28
Gun construction	C. W. Moody	30
B. L. Ordnance	J. R. N. Owen	30
B. L. Ordnance	J. F. Quinby	31
B. L. Ordnance	D. K. Swisher	31
Gun	D. Fitzgerald	34
Gun and projectile	W. E. Ball	36
Gun construction	C. B. Mason	37
Gun construction	T. N. Hornsby	37

V. The following designs are *not* regarded as *suitable for use with guns of large caliber*, and hence are *not recommended* for actual test:

Design for—	Submitted by—	For action, see page of proceedings No.—
Projectile	T. D. Gibson	28
Projectile	F. A. Markley	28
Projectile	E. W. Dunlap	30
Closing breech of gun	H. B. Anderson	31
Projectile	J. D. Richards	32
Projectile	Jos. Bolt	37
Shell	W. W. Hanes	37
Projectile	A. F. Potter	37
Port fire	G. W. Turner	40

VI. The following plans are *not recommended* for actual test, for reasons given in each case in a resolution of the Board, viz:

1. A. W. Kercheval's plan of construction:

Mr. Kercheval presents no detailed design nor description of a heavy gun or projectile for examination by the Board, nor do his general remarks offer anything specific for its consideration. His papers are therefore returned agreeably to his request.

(For action, see page 26, proceedings of the Board.)

2. F. W. Frampton's projectile:

The Board has examined the model of a projectile submitted by Mr. Frampton, and is of the opinion that in simplicity of construction and certainty of operation it is inferior to the service projectile now in use.

(For action, see page 28, proceedings of the Board.)

3. H. H. Sibley's projectile:

The Board has examined the several communications of Mr. H. H. Sibley, and the accompanying model, and is of the opinion that his proposed projectile does not possess that strength and simplicity of construction which would make it effective against armor plates and other objects of great resistance.

(For action, see page 30, proceedings of the Board.)

4. W. T. Depue's projectile:

The Board is of the opinion that the projectile proposed, being made of several parts, lacks the necessary strength and simplicity; and the form of the point is not as good as the ogival now in use.

(For action, see page 31, proceedings of the Board.)

5. D. Warner's plan for increasing the range of projectiles:

The Board has examined Mr. D. Warner's models and description of his plan for increasing the range of projectiles, and is of the opinion that it is wrong in principle.

(For action, see page 32, proceedings of the Board.)

6. J. W. Blake's system of gun construction:

In the opinion of the Board, Mr. Blake's system is not a suitable one for gun construction.

(For action, see page 37, proceedings of the Board.)

7. F. A. Dennette's projectile:

The Board having examined the plans of projectiles submitted by Mr. F. A. Dennette, is of the opinion that they possess no advantages over projectiles already in use.

(For action, see page 38, proceedings of the Board.)

8. J. Echols' plan for bursting shells containing coal gas:

Mr. Echols' plan for bursting shell is not deemed as good as the means at present employed.

(For action, see page 42, proceedings of the Board.)

9. Wm. Van Gieson's projectile:

The Board having examined the model and letters patent of a projectile for rifle cannon, submitted by Mr. Harding for Mr. Van Gieson, is of the opinion that the projectile is not as good as those already in use.

(For action, see page 45, proceedings of the Board.)

10. H. Reilly's projectile and system of rifling:

The Board * * * is of the opinion that Mr. Hugh Reilly's projectile is not any better, if so good, as those already in use and as it is composed of several parts it would not be effective against armor. * * * The question of rifling is one it is not called upon to decide and could not do so without a series of experiments entirely beyond its means and which can only be undertaken by a special board.

(For action, see page 46, proceedings of Board.)

11. Jacob Reese's process for the manufacture of steel cannon:

Mr. Reese has not presented to this Board any drawing exhibiting a plan for a gun. He recommends for gun construction, steel made by the Basic in contradistinction to the acid process. His method, as described in a general way in his papers, consists in pouring molten Bessemer or other steel around a hammered steel core, 14 inches in diameter for a 12-inch gun, until the mold, giving its form, is filled. After cooling,

the piece is bored. It will thus be seen that Mr. Reese's proposition is to make a cast-steel gun which does not meet the approval of this Board.

(For action, see page 46, proceedings of the Board.)

12. W. W. Hubbell's improved system of B. L. ordnance:

Mr. Hubbell's plan of a breech fermeture, described in his letters patent and accompanying papers, is not regarded as equal to the two systems now in use. He proposes for gun construction cast iron produced by some process which, in his opinion, gives it greater tensile strength, but on this point this Board has no information. His plan for a gun is so indefinite it is presumed it is only intended to show the fermeture. In fact the Board has not before it any plan from Mr. Hubbell for a gun of suitable form and dimensions to be recommended for construction, and without further knowledge of his metal it must be looked upon as cast iron.

(For action, see page 47, proceedings of the Board.)

13. C. Dunderdale's "Ferris" system of gun construction:

The Board is of the opinion that the Ferris system of gun construction does not present any special advantages or improvements.

(For action, see page 47, proceedings of the Board.)

14. S. B. Dean's gun construction and breech fermeture:

In his letters Mr. Dean does not propose to construct a gun, but rather recommends that one be constructed by the government of cast steel, prepared after the Terre Noire method. It is understood that in this process the steel, after being cast, is annealed, which is supposed to produce a similar effect to rolling or hammering. The Terre Noire steel thus made has been found excellent for projectiles, but the Board has no knowledge of its suitableness when cast in the large masses required for guns of 50 tons and upwards. Until more is known of this metal by test the Board does not recommend it for gun construction. The Board is of the opinion that Mr. Dean's plan of breech fermeture does not present any advantages over those now in use.

(For action, see page 47, proceedings of the Board.)

15. Col. T. T. S. Laidley's proposition that a cast-iron rifle-gun be tested, and:

Wm. P. Hunt's printed letter advocating the best cast iron as a metal for gun construction.

A proposition—

"that the Board select from the various projects before it of cast-iron guns, pure and simple, one that fairly represents the whole and recommend a 12-inch gun for construction and trial"—

was not adopted.

Not unanimous—two members voted in the affirmative.

(For action, see page 48, proceedings of the Board.)

16. D. Tuft's plan for B. L. ordnance:

The Board is of the opinion that Mr. Tuft's system of breech mechanism possesses no advantages over, if it is equal to, those already in use, which have been thoroughly tried.

(For action, see page 49, proceedings of the Board.)

17. R. R. Moffatt's plans for gun construction and conversion:

The Board is of the opinion that the plan of gun construction and conversion submitted by Mr. R. R. Moffat does not present any advantages over methods now in use.

(For action, see page 49, proceedings of the Board.)

18. Norman Wiard's proposals to the Secretary of War for the construction and conversion of heavy guns.

The Board does not assent to the arguments of Mr. Norman Wiard as set forth in the various letters, papers, &c., accompanying his proposals of July 1, 1880, and March 28, 1881; referred to it, through the Chief of Ordnance, by the Secretary of War, in indorsements on letter of Mr. Wiard of the 14th of May, 1881; to show the superiority and expediency of adopting his plans of gun conversion.

(For action, see page 50, proceedings of the Board.)

19. Norman Wiard's amended proposals, dated January 2, 1882:

With regard to Mr. Norman Wiard's modifications of his proposals of the 28th of March, 1881, presented to the Board by indorsement of the Secretary of War, dated February 3, 1882, viz, dividing said proposal of March 28, 1881, into four parts, for the purpose—

1st. Of furnishing part of the powder for the tests and determining the best kind to be used for the guns referred to; the best width and depth of grooves and pitch of rifling for these guns, with original length of bores unchanged; to testing the power of these guns for penetration into iron and earth, when converted into combined rifles and smooth-bores; to apply and test the "snubbing rope" plan for checking recoil; to take velocities of all projectiles during this part of experiments, &c.

2d. To test by rapid firing the endurance of the guns referred to above.

3d. "To confine experiments to the conversion, trial, and proof of powder for the penetration of iron targets and earth works of two 15-inch smooth-bore Rodman guns into long-bore breech-loading rifled guns, &c."

4th. The furnishing of all supplies as stated in detail. * * *

The Board does not approve of the conversion of any of the smooth-bore guns now possessed by the government, and particularly does not approve of the system or systems proposed by Mr. Wiard. * * * And (referring to the Secretary of War's indorsement) the Board does not consider the form of the proposals objectionable, and therefore has no modifications to suggest.

(For action, see page 61, proceedings of the Board.)

20. Master S. Seabury's plans of gun construction, carriage, and fuze:

The gun construction for a 9-inch gun submitted by Master Samuel Seabury, United States Navy, is objectionable in several respects, principally in the fact that a large mass of steel is required for the breech-receiver, which would be difficult to make and difficult to work sufficiently, particularly in this country, to insure that homogeneity necessary for strength in that part of the construction in connection with his special fermeture; again, the breech-receiver projects unsupported beyond the body of the gun, and is thus subjected to vibration; again, the breech mechanism is similar, but not superior, to the Krupp, which this Board is not prepared to recommend. * * *

The subject of gun carriages and fuzes is not within the scope of the Board's investigations.

(For action, see page 51, proceeding s of the Board.)

21. The plans of gun construction, including that of the 12-inches B. L. rifles now under contract, submitted by Col. S. Crispin and Capt. C. S. Smith, Ordnance Department:

Respecting the plans of gun construction submitted by Col. S. Crispin and Capt. C. S. Smith, through the Chief of Ordnance, viz:

Two cast-iron casings with steel tube and breech receiver; one having an interrupted screw fermeture, the other a round wedge fermeture.

Three cast-iron casings with steel breech receiver; two with interrupted screw, and one with round wedge fermeture; and,

Four cast-iron casings with wrought-iron tube and steel breech receiver; three with interrupted screw, and one with round wedge fermeture.

Those having combinations of wrought iron, particularly coiled wrought iron, as a lining for steel breeching and cast-iron casing are in the Board's estimation objectionable. Although the greater part of the conversions using wrought iron as a lining tube, as detailed in the yearly reports of the Chief of Ordnance, have given in small guns apparently good and encouraging results, it is on the whole, considering the history of all the guns so converted and constructed, including the 11-inch and 12.25-inch, a questionable success.

But in so expressing itself the Board desires it to be distinctly understood that it does not overlook the fact that in the small guns referred to, comparatively ineffective smooth-bores have been converted into effective rifles, deeming it simply unwise to continue the use of wrought-iron tubes, particularly for breech-loading conversions and all calibers above 8 inches, until it shall have been shown that other conversions and constructions are not what, from the most advanced views, we have a right to expect. Of those with steel breech receivers, with and without steel tubes, those having the round wedge fermeture require a breech receiver so massive that the necessary working of the metal, to give it the uniform strength required for such construction, is impracticable in this country at this time, it being the opinion of the Board that this system of fermeture requires, to compensate for the cutting away of so much metal, a highly wrought steel of homogeneous structure, the difficulties of

producing which increase very rapidly with the size of the piece; and those with the interrupted screw fermeture, the breech receiver extending beyond the casing, lack its support, and may, for that reason, be defective in strength and require, like those with the wedge fermeture, a highly wrought and large piece of steel.

Resolved, In view of the objections above set forth that this Board does not recommend any of these constructions for trial.

(For action see page 53, proceedings of the Board.)

22. Dr. J. H. McLean's system of gun construction:

The Board regards the system of gun construction presented by Dr. J. H. McLean, of Saint Louis, Mo., as exhibited in his plans and description, as defective in the following respects: That the weight of the whole gun and its parts is objectionable; that it has a multiplicity of parts, and much complex machinery; that the breech-block is much larger and heavier than those successfully and extensively now in use; that the system is deficient in strength, and upon the whole is impracticable for heavy ordnance.

(For action, see page 56, proceedings of the Board.)

23. D. M. Mefford's plan for gun construction:

The Board does not approve of the plans of gun construction submitted by Mr. D M. Mefford, of Toledo, Ohio.

(For action, see page 58, proceedings of the Board.)

24. A. H. Emery's plan for the conversion of smooth-bore guns:

This Board is of the opinion that the 15-inch and 10-inch guns on hand are needed for service as they are, and that it would be inexpedient to convert them into breech-loading rifles by any process. It cannot therefore recommend their conversion by the methods presented in Mr. Emery's plans.

(For action, see page 67, proceedings of the Board.)

25. Maj. S. C. Lyford's plan for gun construction:

It is the opinion of the Board that the plan for a wrought-iron gun presented by Maj. S. C. Lyford, Ordnance Department, may be practicable for the lower caliber guns, but that it is of doubtful use for those of large caliber, which it is believed can be better made of other material.

(For action, see page 72, proceedings of the Board.)

26. B. B. Hotchkiss' plan for gun construction:

The plan of a steel and wire gun designed by Mr. B. B. Hotchkiss, and presented by the Chief of Ordnance, being only of 6-inch caliber, hardly comes within the category of heavy ordnance, while the information given is very meager as to details of construction. It is submitted confidentially to the Board, which alone precludes any official consideration of, and report upon, its merits. It is therefore respectfully returned to the Chief of Ordnance.

(For action, see page 74, proceedings of the Board.)

27. Dr. W. E. Woodbridge's plan for gun construction:

The plan of an 18-inch brazed steel wire gun reinforced with wire soldered, submitted by Dr. W. E. Woodbridge, marked Plate VII, was laid aside, being of too large a caliber to warrant a recommendation for its actual test, since experiments to test the efficiency of the wire system are but just commenced with guns of 6-inch, 8-inch, and 10-inch calibers.

(For action, see page 74, proceedings of the Board.)

28. H. F. Mann's plan for gun construction and breech-mechanism:

This gun consists of a cast-iron barrel, bound around the powder chamber by steel bands. It is 30 feet in length, weighs 92,000 pounds, and is balanced on its trunnions. The breech fermeture is held to the trunnions by heavy steel straps, the whole arrangement weighing 37,000 pounds additional to the weight of the barrel, giving a total weight of 129,000 pounds. This fermeture is the characteristic feature of the gun, and is the invention of Mr. Mann. The principal objection to it is its great weight, but further it necessitates the turning of the barrel of the gun on its trunnions through an arc of about 10° and back again at each discharge, requiring the expenditure of

more time and force than for either the Krupp-wedge or the slotted-screw systems. The piece possesses no advantages over the cast-iron gun bound with steel bands and with the screw fermeture recommended by this Board for trial, unless it be that it gives greater security against transverse rupture. Trials, however, of guns of similar construction, but with the simple screw fermeture, have proved successful within moderate limits of powder pressure, all that is claimed for the design of Mr. Mann, as is evidenced by his powder charge and weight of projectile. The only apparent merit of the structure consists in relieving the body of the gun from longitudinal strains and transferring them through the detached breech by means of steel straps to the trunnions. But in view of the objections set forth above to the fermeture itself, the speciality of Mr. Mann's invention, this Board fails to see sufficient reasons for recommending the gun for construction and trial.

(For action, see page 75, proceedings of the Board.)

VII. The following designs for guns are *not recommended* for actual test, as the Board has preferred others of the same class for that purpose:

Design for—	Submitted by—	For action, see page of proceedings No.—
Gun construction. Designs A, D, E, F, G, H, I, J, K, L, B_2, F_2, I_2, M, N, O, and P.	William P. Hunt	70, 71, and 75
Wire-wrapped cast-iron rifle	Col. T. T. S. Laidley	70
Cast-iron gun banded and steel gun. Plates I, III, and V	Dr. W. E. Woodbridge	70, 71, and 74
Gun construction. Plates A_1, A_2, A_3, B_1, B_2, C_1, C_2, E_1, E_2, F_1, F_2, G, and K, D_1, and D_2.	Chief of Ordnance	70
Gun construction. Plates 1, 2, 3, 4, and 5	A. H. Emery	71
Wire gun	Lt. C. C. Morrison	75
Steel gun, on Schultz's plan	Col. S. Crispin	75
Steel gun	L. W. Broadwell	37
Heavy ordnance	D. G. Smith	31

VIII. The following designs for projectiles and heavy guns are RECOMMENDED for trial in accordance with the resolution of the Board, given in each case, viz:

a. D. L. Kennedy's spiral-drill point projectile:

If at any time the Ordnance Department should be engaged in experiments to determine the penetration of different kinds of projectiles into iron, this Board recommends that Mr. Kennedy's proposed spiral projectile be also tried; but it is not deemed advisable to construct an iron target simply to test his device.

(For action, see page 62, proceedings of the Board.)

b. Paulding, Kemble & Co.'s plans of gun construction:

Messrs. Paulding, Kemble & Co.'s system of gun construction, as explained in their printed letter and accompanying drawing No. 2, has merit in common with like combinations involving a cast-iron case jacketed and hooped with steel, but in the opinion of the Board the wrought-iron lining tube is objectionable. The arrangement of the contiguous parts in connection with the screw-breech closure is a good one to secure strength against fracture by longitudinal strains. The characteristic feature of this gun construction, however, seems to be the casting of the iron case in two pieces, which will effect a great saving, provided it proves efficient in strength. If any guns are made after this general system of metal combination it is recommended that the case of one be cast in two pieces for trial to test its strength.

(For action, see page 52, proceedings of the Board.)

c. Master Samuel Seabury's rifle projectile:

The Board is of the opinion that the particular merit or advantage claimed by Master Seabury for his projectile is only a matter which can be definitely determined by actual experiment, which the Board is not in a position to undertake, and while the results in Europe of the use of copper bands are sufficiently satisfactory, the details of the number of bands, their size, and the mode of attachment, as they affect the strength and ability to penetrate iron armor, should, in the opinion of the Board, be left to

future experiment; and it is therefore recommended that this projectile be tried by the Ordnance Department, with others, when circumstances and opportunity are favorable.

(For action, see page 51, proceedings of the Board.)

d. H. F. Mann's rifle projectile:

The particular merit claimed by Mr. Mann for his projectile is the number, position, and mode of attachment of the bands. The question how these details will affect the strength and penetrating power of the projectile can only be settled by future experiment, and it is therefore recommended that this projectile be tried by the Ordnance Department, with others, when circumstances and opportunity are favorable.

(For action, see page 76, proceedings of the Board.)

e. Paulding, Kemble & Co.'s (the improved Parrott) rifle projectile:

The improved Parrott projectile for muzzle-loading guns is recommended for actual test in connection with other projectiles in experimental or practice firing, with the 8-inch muzzle-loading rifle.

(For actions, see page 62, proceedings of the Board.)

f. B. B. Hotchkiss' rifle projectile:

That, with regard to the Hotchkiss projectile submitted with letter of February 6, inclosing a tracing of it, as it is known by actual test to be a good and reliable projectile for breech-loading guns, resolved that it be recommended for further trial by the Ordnance Department.

(For action, see page 62, proceedings of the Board.)

g. Wm. P. Hunt's (the Butler) rifle projectile:

As the Butler projectile, of which drawings and description are submitted by Mr. W. P. Hunt, is known by actual trial to be a good and reliable projectile for both muzzle and breech-loading guns, it is recommended for further trial in competition with other projectiles.

(For action, see page 66, proceedings of the Board.)

h. W. T. Arrick's "Eureka" rifle projectile:

Though the Arrick or "Eureka" projectile has been extensively tried, still there can be no objection to its further trial in competition with other projectiles.

(For action, see page 48, proceedings of the Board.)

i. W. E. Woodbridge's rifle projectile:

The rifle projectile proposed by Dr. W. E. Woodbridge, shown in Plate VIII, accompanying his letter of March 29, 1882, is recommended as worthy of actual test in competition with other projectiles.

(For action, see page 76, proceedings of the Board.)

k. Lieut. A. H. Russell's design for a loading pan:

The Board recommends, in the test of any piece of breech-loading ordnance with a fermeture to which it can be applied, that a device of the kind proposed by Lieutenant Russell, Ordnance Department, be tried.

(For action, see page 49, proceedings of the Board.)

l. Chief Engineer George Quick's breech-loading device:

The breech-loading device of Chief Engineer George Quick, R. N., though of doubtful superiority to other systems now extensively used abroad, yet appears to possess sufficient merit to warrant its trial, should the Ordnance Department find it convenient so to do in the construction and test of new cannon.

(For action, see page 58, proceedings of the Board.)

m. Paulding, Kemble & Co.'s breech-loading device:

The breech-loading device presented by Paulding, Kemble & Co., shown in drawing marked "Study in Ordnance," submitted by the Chief of Ordnance, with his letter

dated February 6, 1882, appears to possess sufficient merit to warrant its trial, should the War Department find it proper so to do in the construction and test of new cannon.

(For action, see page 61, proceedings of the Board.)

n. The "Lyman-Haskell accelerating or multicharge" cannon:

The Board recommends that the "Lyman-Haskell accelerating or multicharge" gun recently cast at Reading, Pa., be transported to Sandy Hook, and thoroughly tested under the direction of the War Department at the expense of the United States, as proposed by Mr. Haskell in his communication of October 5, 1881.

(For action, see page 50, proceedings of the Board.)

The estimated cost of the test is:

For transportation of gun from Reading, Pa., to Sandy Hook, N. J., and mounting, including all expenses incident thereto	$600 00
For test:	
Powder per round	$26 90
Projectile	28 00
Gas check, labor, &c., during test, per round	10 25
Total, per round	65 15

p. Dr. W. E. Woodbridge's plan of a wire wound cast-iron gun, wire soldered (Plate II), and Plans M and H, submitted by the Chief of Ordnance:

The Board is of the opinion that the combined cast-iron and steel guns represented in the plans submitted by the Chief of Ordnance with his letters of January 17, and April 29, 1882, marked M and H, and in the plan submitted by Dr. W. E. Woodbridge with his letter of March 29, 1882, modified by letter of May 3, 1882, and marked Plate II, should be constructed and tried, for the following reasons:

1st. Experience thus far gained with similar guns promise for the combination success within usual limits of powder pressure,

2d. They can be readily and rapidly produced in this country without incurring the delay of sending to foreign countries for large masses of forged steel. The great weight of the foregoing guns recommended for test is, however, objectionable, and this Board would prefer such combinations of materials possessing the highest tensile strength as will produce, with less weight, a gun capable of giving the high velocities now sought for. But while this latter class of guns is being developed through a series of careful and costly experiments, some cheaper gun, though of less power, susceptible of rapid production, in case of need, should be determined upon, so that the country may not be left entirely defenseless.

(For action, see page 70, proceedings of the Board.)

The estimated cost of the construction and test of these guns is:

For construction:	
Of gun represented by Plate II	$11,100 00
Of gun represented by Plan M	37,289 00
Of gun represented by Plan H, including $6,000 for preparation	41,170 00
Total	89,559 00
For test:	
Of gun represented by Plate II:	
Powder, per round	$25 50
Projectile	39 00
Labor, &c., during test, per round	13 10
Total, per round	77 60
Of gun presented by plan M:	
Powder, per round	$76 00
Projectile	72 25
Labor, &c., during test, per round	15 75
Total, per round	164 00

Of gun represented by Plan H:	
Powder, per round	$70 89
Projectile	72 25
Labor, &c., during test, per round	15 75
Total, per round	158 89

q. The design for a 12-inch M. L. rifled mortar submitted by the Chief of Ordnance:

The Board recommends that a rifled mortar be constructed for experiment, of the caliber and dimensions proposed by the Ordnance Department, with such projectiles as that department may determine as best suited for the purpose. These mortars are very much needed for harbor defense, and emplacements for them have already been made ready at many important places on our sea coast.

(For action, see page 71, proceedings of the Board.)

The estimated cost of the construction and test of this mortar is:

For construction	$7,148 00
For test:	
Powder, per round	$14 02
Shell	52 25
Labor, &c., during test, per round	14 50
Total, per round	80 77

r. W. P. Hunt's design B for a B. L. steel rifle:

This Board is of the opinion that an all.steel gun should be tested. Several of the plans for such guns presented to the Board—notably that submitted by Mr. W. P. Hunt with his letter of April 15, 1882, marked design B, that submitted by Mr. A. H. Emery, with his letter of January 23, 1882, marked Plate 5, and that submitted by Dr. W. E. Woodbridge with his letter of March 29, 1882, marked Plate III—have undoubted merit. Of these we prefer the design of Mr. Hunt, but recommend for construction and trial a 10-inch gun after the same plan instead of the 8-inch gun shown on the drawing. Although aware that the construction of this gun is not at this time within the facilities afforded by our own manufactories, and will therefore involve the importation of the large steel tubes that go to make up the piece, we still think the gun should be tried to test the system as compared with other systems recommended, especially the forged steel and wire guns.

(For action, see page 71, proceedings of the Board.)

The estimated cost of the construction and test of this gun is:

For construction, (this will depend on the cost of imported steel for a trial gun) at the present rates, probably	$32,516 00
For test:	
Powder, per round	$45 90
Projectile	39 00
Labor, &c., during test, per round	13 10
Total, per round	98 00

s. Dr. W. E. Woodbridge's brazed steel wire gun, Plate VI.

A gun of 10-inch caliber, after the design of Dr. W. E. Woodbridge, was recommended for construction by the Board on Heavy Rifled Ordnance, convened by General Orders No. 57, of June 28, 1872. This device involved a steel tube to be bound around by steel wire under the requisite tension, and to be united by brazing with bronze. The gun was constructed at Frankford Arsenal and submitted to a trial of 93 rounds, 83 of which were fired under the direction of this Board. It burst into two parts, just behind the trunnions, under a powder pressure of about 80,000 pounds to the square inch, as measured by the Rodman gauge. An examination and tests, at the Watertown Arsenal, of sections cut from the broken gun revealed the fact that the brazing was imperfect. Several difficulties occurred in the construction of this piece from the lack of experience in applying the brazing system to so large a mass; and, further, it seems probable that undue initial strains were developed on the exterior

in cooling which assisted largely in producing the transverse rupture. Could the brazing have been moderately well effected, and the interior and exterior coolings properly regulated, it is believed that the gun would have been exceptionally strong. It is a merit of this method of construction that the material is not liable to give way, causing rupture, without previous indications. The transverse crack behind the trunnions, where the rupture took place, increased during the firing by increments so minute that, from the 65th to the 85th round, that increase amounted to only $\frac{1}{100}$ of an inch. There could, therefore, be little if any apprehension that guns made after Dr. Woodbridge's system would burst without previous warning, though imperfectly constructed.

In view of the fact that the gun tried stood quite severe tests, notwithstanding its imperfections, and that the plant used in its construction still exists at Frankford Arsenal, it is recommended that another 10-inch gun, after the model presented by Dr. Woodbridge (Plate VI, accompanying his letter of March 29, 1882) be made for further trial. It is suggested that the method of strengthening the walls of the gun as against longitudinal strains, shown on his drawing for a 12-inch gun (Plate IV), be adopted in the construction proposed.

Not unanimous. Two members voted in the negative. (For action, see page 73, proceedings of the Board.)

The estimated cost of the construction and test of this gun is—

For *construction*, including alteration to "plant"	$25,500 00
For *test:*	
Powder per round	51 00
Projectile	39 00
Labor, &c., during test per round	13 10
Total, *per round*	103 10

t. Design for a steel wire gun, submitted by the Chief of Ordnance.

Though the wire gun has had but a limited trial it seems to promise the strength requisite for the attainment of high initial velocities. The precise combination of parts that will give the best results for steel wire guns has not as yet been arrived at. To reach the solution of the problem it will be necessary to experiment with different gun constructions after this general method, and it is with this view that the Board recommends that the 8-inch wire gun presented by the Ordnance Department be constructed for trial.

(For action, see page 74, proceedings of the Board.)

The estimated cost of the construction and test of this gun is—

For *construction*	$11,400 00
For *test:*	
Powder per round	31 87
Projectile	19 50
Labor, &c., during test per round	10 50
Total, *per round*	61 87

w. Dr. W. E. Woodbridge's steel gun, longitudinal bars, wire-wound, wire soldered (Plate IV):

It is the opinion of the Board that the plan of a 12-inch gun submitted by Dr. W. E. Woodbridge, Plate IV, accompanying his letter of March 29, 1882, consisting of steel tubes and bars strengthened by wire wrapped and soldered, presents a combination and arrangement of material and parts which gives sufficient promise of strength to warrant a trial of this system of construction. The large charge of powder and heavy shot proposed to be used places it in the front rank of high-power guns, and while there may be some doubt as to its ability to endure what is claimed for it, especially with the present arrangement of the two tubes, it is believed that a high-power gun can be made on this general plan, and it is with this view that the Board recommends that a 10-inch gun on this plan be made and submitted to actual test.

(For action see page 74, proceedings of the Board.)

The estimated cost of the construction and test of this gun is—

For *construction*, including special "plant"	$25,000 00

For *test:*

Powder, per round	$51 00
Projectile	39 00
Labor, &c., during test per round	13 10
Total *per round*	103 10

x. The wire-wrapped B. L. steel rifle, after the plan of Schultz, submitted by Col. S. Crispin (Plan I):

The design for a wire-wrapped B. L. steel rifle gun, after the plan of Captain Schultz, French Artillery, for securing a division of strains, presented for the consideration of this Board by Colonel Crispin, of the Ordnance Department, having already been tried abroad, with more or less success, is recommended for test, in common with the other designs of wire guns heretofore recommended, with a view to determining the best combination of parts for this general system of gun construction.

Not unanimous—one member voting in the negative. (For action, see page 75, proceedings of the Board.)

The estimated cost of the construction and test of this gun is—

For *construction* (this will depend on the cost of the steel parts and on the amount of royalty that would be claimed), probably about	$24,190 00
For *test*, assuming a weight of powder charge and projectile (the items not being given)—	
Powder, per round	38 25
Projectile	33 25
Labor, &c., during test, per round	11 75
Total, *per round*	83 25

In conclusion this Board presents the following brief reference to prevailing opinions and methods of gun-construction as developed in the practice and experience of leading military nations during the past twenty years, and in connection therewith the considerations that have determined its recommendations for the construction and trial of the several designs for heavy guns enumerated in preceding resolutions of the Board.

The change from the former comparatively light smooth-bore gun to the heavy rifled cannon of the present day, throwing an elongated projectile of at least three times the weight of a spherical shot of the same caliber has led to the almost entire abandonment of cast iron, unaided by other metals, for gun construction, and to the trial and adoption in its stead of metals of higher tensile strengths and elastic limits, as forged iron and steel. It is true that the Italian military authorities, and especially those of France, have experimented quite extensively with combinations of cast iron and steel for heavy guns with good results; the present naval and sea-coast armament of the latter nation being made up in great part of such guns.

It seems, however, from information at our command that neither of these nations is disposed to rest satisfied with this combination of material for gun construction. In fact, the French have instituted trials with all steel, and recently with steel wire-wrapped guns. Herr Krupp's rifled guns are made solely of forged steel. They have been adopted in Germany, Austria, and by some of the minor powers of Europe. Though the Armstrong and Woolwich guns are constructed essentially of wrought iron, we infer from various sources that English opinion, in common with that of the continent, points to the use of steel in some shape as the future material for heavy guns both for land and naval service. The combinations of this material, as well as those of wrought iron, known as the built-up system, thus far tried with more or less

success, consist of a lining tube surrounded by concentric rings or cylinders of greater or less length connected together by methods varying with the ideas of the designers, as in the Krupp, the Woolwich, and the Armstrong systems.

These different systems all agree in this, that the assemblage of parts shall produce compression upon the inner layers and extension upon the outer, so as to call forth in the most effective manner the resistance of the several rings when subjected to the strains due to the explosion of the charge.

Though long since a recognized fact that the penetration of projectiles into iron increases far more rapidly with velocity of impact than with weight of shot, it is only within a few years that changes in gun construction have been initiated looking to a large increase of initial velocities. These recent changes have involved great increase in the length of gun and in the capacity of the powder chamber, by which means about one-third additional velocity of projectile has been reached, and, notably, in the 9.45-inch Krupp gun, and in the wire bound Armstrong gun recently constructed and tried, about one-half.

So far as we can learn, the leading military nations of the world, though already provided to some extent with guns of medium power, more or less satisfactory, are now looking for such combinations of metals as will produce a stronger gun capable of burning a very large charge of powder so as to attain the highest possible initial velocities with safety.

Steel in some form seems to be regarded as the best metal to accomplish that end. The fact that steel wire can be produced with more than twice the tensile strength of steel forged as rings has probably induced the recent construction, for trial, of wire bound guns both in England and France. It is understood that so far as these trials have progressed the results are favorable, indicating the attainment of high velocities.

Now, the forging of the large masses from which the rings are produced by boring, that constitute the successive layers of the steel gun, involves a very expensive plant; is a very slow and costly process, and does not result uniformly in the attainment of a perfectly homogeneous metal. It would therefore be economy and probably give better results if the outer layers of the gun could be replaced by steel in a shape more readily produced and possessed of greater tensile strength. It is in part with this view that steel wire seems to have been suggested for wrapping under initial strains the interior tube and next consecutive concentric bands of the steel gun. The wire by its great tensile strength cannot fail to impart the requisite tangential strength to the structure. The only apparent difficulty of the combination is in the parts that give resistance to longitudinal strains developed in firing.

Dr. W. E. Woodbridge, who seems to have been the inventor or suggestor of the wire gun, has attempted to attain resistance to transverse rupture other than that due to the great friction of the parts, by uniting them by brazing with bronze.

In Sir William Armstrong's wire gun resistance to longitudinal strains is effected by the introduction of lengthwise layers of steel wire surrounding the barrel between layers of the wrapping wire, and in Schultz's gun the breech is bound to the trunnion ring by round bars of steel.

Though experiments have not yet been carried to the extent of determining the best combination of parts for this gun, within their limited range, they are so promising as to induce this Board to suggest and recommend that persistent trials be made with wire guns presenting

different combinations, with a view to a full and satisfactory test of the system.

It is believed that a wire gun can be constructed with the facilities presented by the manufacturing establishments of our own country, whereas the gun built up of concentric forged steel rings is beyond those facilities as now developed, and can therefore only be produced with great delay and cost.

Though the experience of our own country has shown that heavy guns possessing moderate power can be made of cast-iron solely, we do not regard it as a reliable metal for our sea-coast armament. We have, however, recommended for trial two cast-iron guns, banded with steel rings and one wrapped with steel wire, with a view to determining their suitableness for supplying, in case of urgent need, a deficiency in the armament of our forts and batteries, and with the belief that such guns can be produced at our own manufactories without much delay.

Although of the opinion that steel guns can be made of great power and endurance on the built-up principle already described, we have recommended one plan only of these guns for construction and trial, for reasons already given. Our recommendations for testing several designs of wire-wrapped guns in preference to those steel-banded are fully set forth in the foregoing remarks.

GEO. W. GETTY,
Brevet Major-General and Colonel Third Artillery.
Z. B. TOWER,
Colonel of Engineers, Brevet *Major-General, U. S. A.*
JOHN MENDENHALL,
Major First Artillery, Brevet Colonel, U. S. A.

The undersigned members do not subscribe to that part of the foregoing report beginning with, and following, the words, "In conclusion this Board presents the following brief reference to prevailing opinions and methods of gun construction, &c.," as they cannot assent to some of the views as expressed therein.

While they believe that the correct theory of gun construction is known and generally agreed upon by experts, the best method of carrying out this theory in practice is still a subject of controversy. The diversity of opinion that exists as to the best material and form of material to be used, or the best combination of materials and the arrangement of the parts, has given rise to many systems of gun construction, the best of which, for our adoption, can only be determined by competitive trial. The reasons for the action of the Board are more or less fnlly given in each case, and further statement here is not thought to be necesssary or advisable.

A. R. BUFFINGTON,
Lieutenant-Colonel of Ordnance.
F. H. PARKER,
Major of Ordnance.

NOTE.—The following addenda will accompany this report, viz:

I. Drawings of the guns recommended by the Board for construction and test.

II. Record of the proceedings and adjournments, including:

A. Record of firing and star-gauging of the Woodbridge 10-inch M. L. rifle.

B. Report on the cutting up of the Woodbridge gun and the test of specimens taken therefrom.

III. A brief description of the various inventions and plans submitted to the Board.

IV. A summary of the action taken by the Board on these inventions, plans, &c.

V. The correspondence and documentary exhibits, including all the matter laid before the Board, papers, plans, models, &c.

VI. Tabular statements, summaries, and general information on the subject of gun construction laid before the Board or compiled by its direction to aid it in reaching its conclusions.

REPORT

OF THE

BOARD ON HEAVY ORDNANCE AND PROJECTILES.

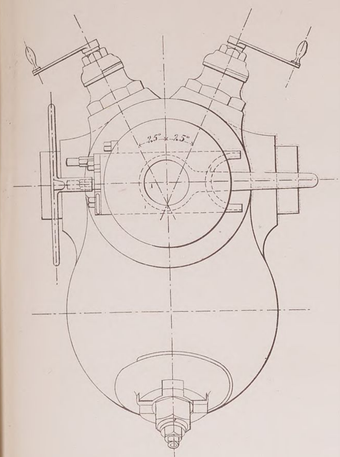
APPENDIX I.

DRAWINGS OF THE GUNS RECOMMENDED BY THE BOARD FOR CONSTRUCTION AND TEST.

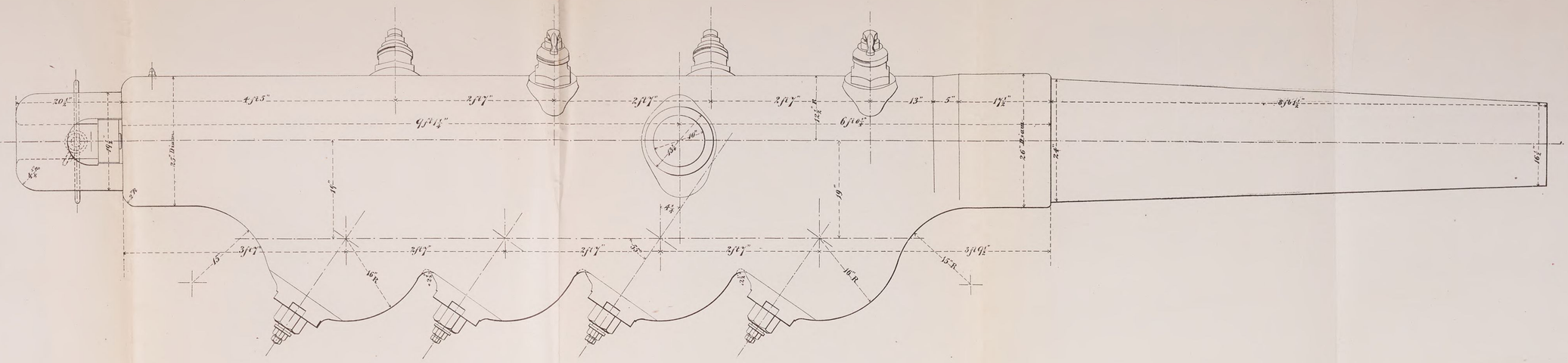
LIST OF DRAWINGS FORMING "APPENDIX I," TO THE REPORT OF THE BOARD ON HEAVY ORDNANCE AND PROJECTILES.

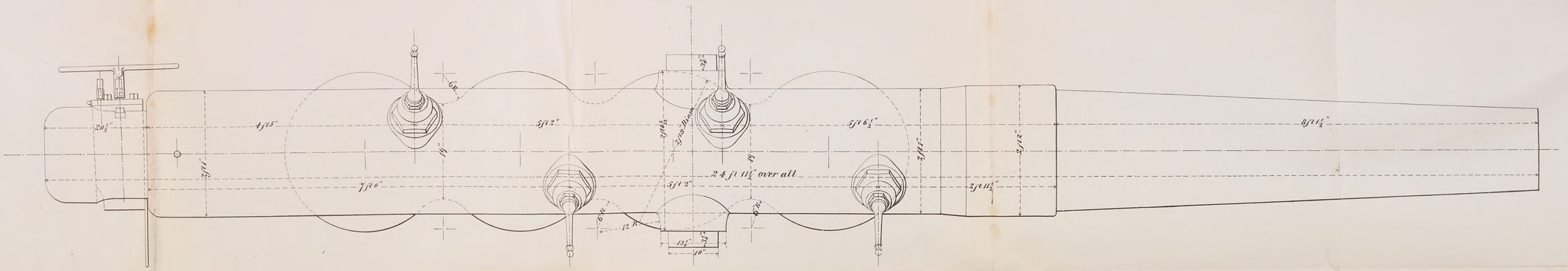
	Marked.
6-inch Lyman Haskell accelerating or multicharge gun	A.
10-inch cast-iron gun, wire wound, wire soldered	PLATE II.
12-inch B. L. rifle, cast-iron body, hooped with steel	M.
12-inch B. L. rifle, cast-iron body, hooped and tubed with steel	H.
12-inch M. L. rifled mortar, cast iron, hooped with steel	L.
8-inch B. L. steel rifle	DESIGN B.
10-inch brazed steel wire gun	PLATE VI.
8-inch steel wire gun	R.
12-inch steel gun, longitudinal bars, wire wound; wire soldered	PLATE IV.
9-inch wire wrapped B. L. steel rifle	PLAN I.

F. E. HOBBS,
Second Lieutenant, Second Artillery, Recorder.

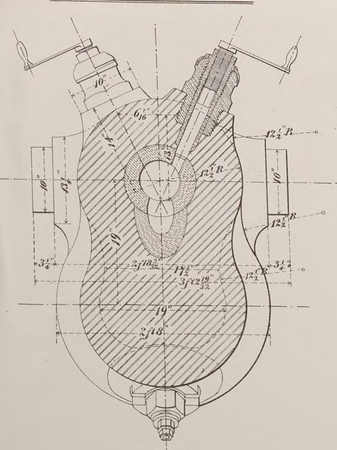


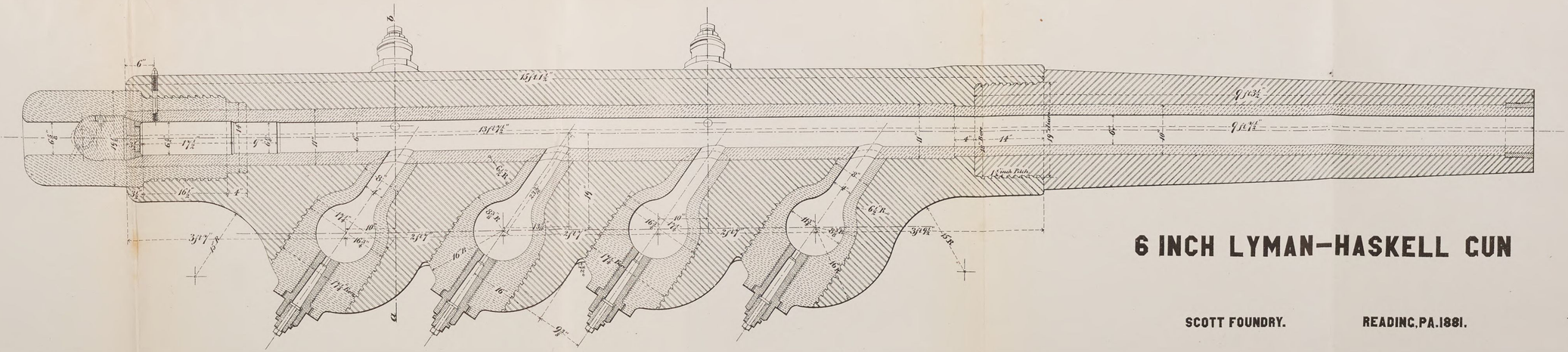
View from Breech End.





Vertical Section at Line a.b.





6 INCH LYMAN–HASKELL GUN

SCOTT FOUNDRY. READING, PA. 1881.

SEN. EX. DOC. No. 178, 1st SESS., 47th CONG.

Appendix I
Report of the Board on Heavy Ordnance & Projectiles.

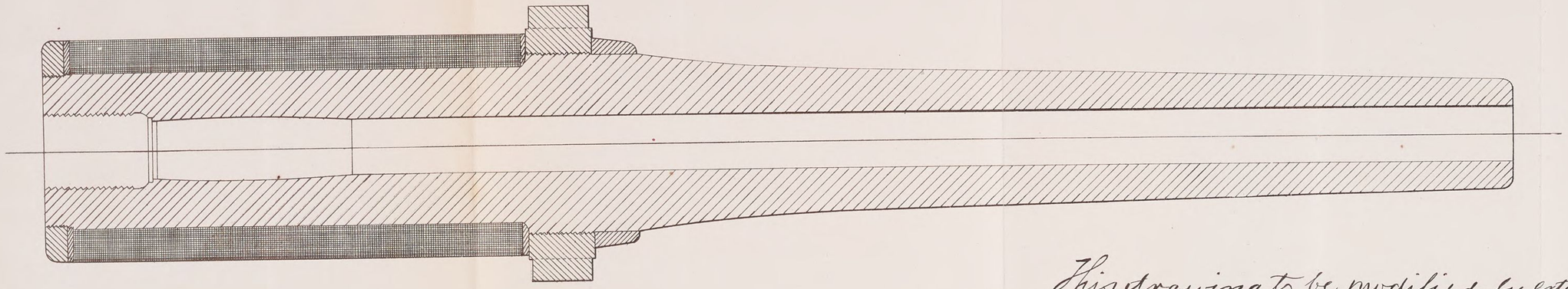
Appendix I
Report of the Board on Heavy Ordnance & Projectiles.

Plate II.

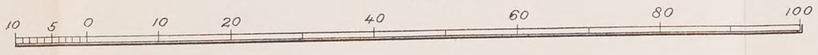
10-INCH CAST-IRON GUN, WIRE-WOUND. 25 CALS.

Wire soldered.

—— PROPOSED BY W. E. WOODBRIDGE. ——



Scale:



This drawing to be modified by extending the length to 30 calibres and making a corresponding change in the position of the trunnions (see letter from Dr Woodbridge dated May 3d. 1882)

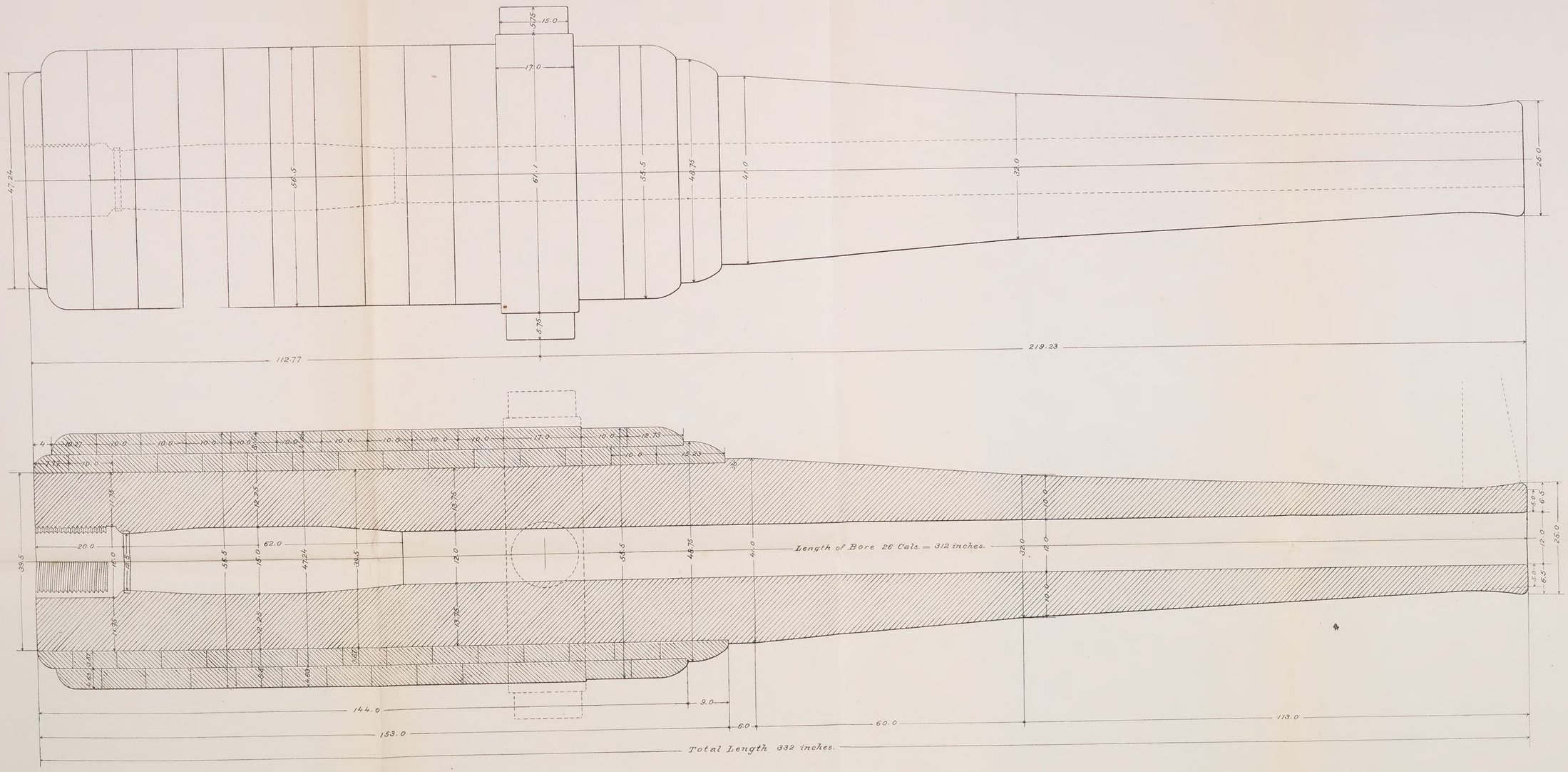
J. G. Hobbs
2nd Lt. 2d Arty
Recorder of the Board.

ORDNANCE OFFICE U.S.A. 1882.

PROPOSED 12-INCH B.L. RIFLE — 57 TONS.

Cast Iron Body, Hooped with Steel.

Interrupted Screw Fermeture.



Steel.

Cast Iron.

Weight of Steel	53544 lbs.
" Cast Iron	73740 "
Total Weight	127284 lbs.

Charge.
280 to 300 lbs.

Projectile.
750 lbs.

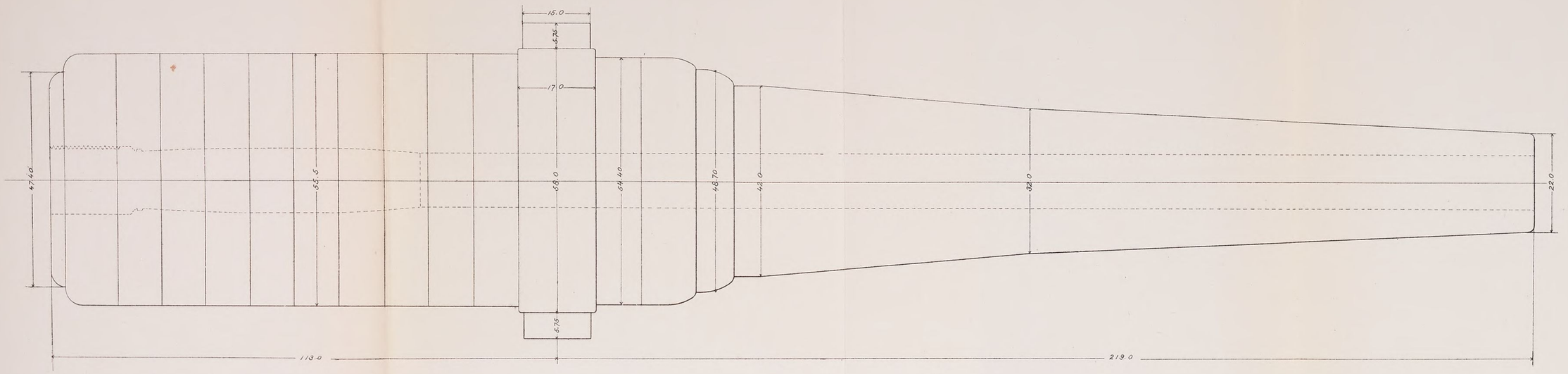
Appendix I

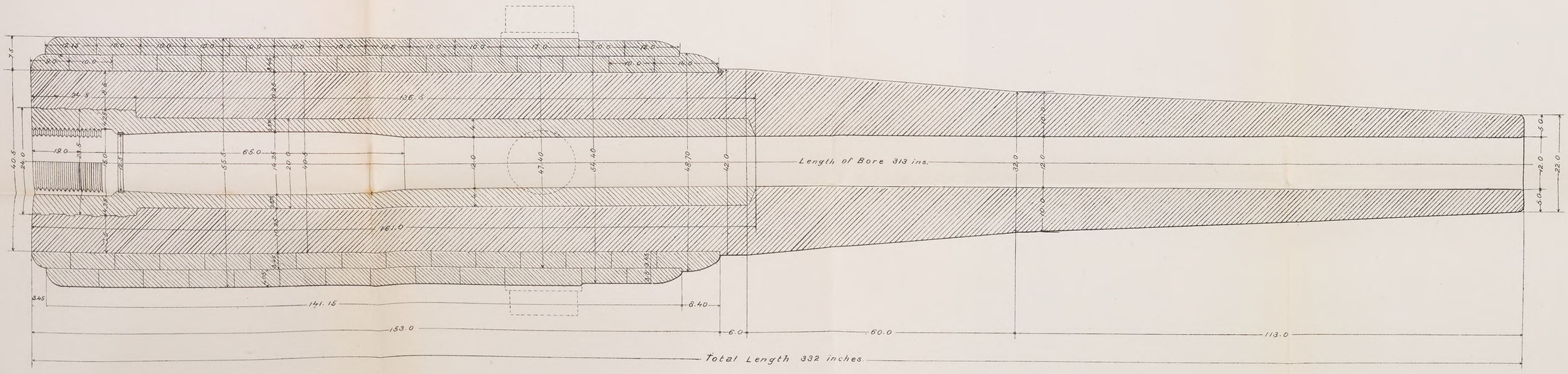
Report of the Board on Heavy Ordnance and Projectiles.

PROPOSED 12-INCH B. L. RIFLE — 56 TONS.

Cast Iron Body, Hooped and Tubed with Steel.

Interrupted Screw-Fermeture.





Steel.

Cast Iron.

Weight of Steel Tube	8865 lbs.
" " " Hoops	46550 "
" " " Breech Block	955 "
Weight of Cast Iron	69928 "
Total Weight	126398 lbs.

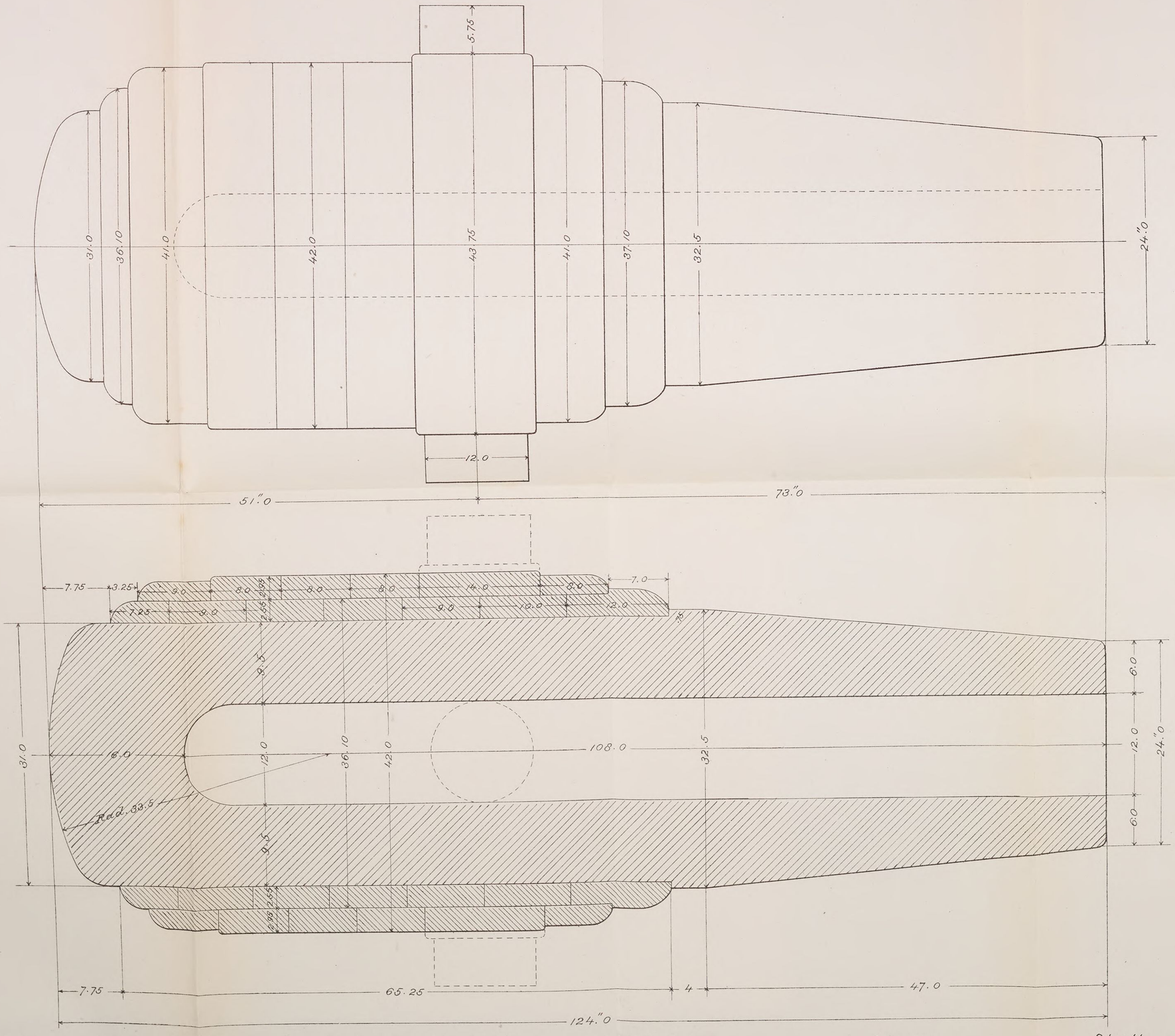
Charge.	Projectile.	Density of Loading
278 lbs.	750 lbs.	0.8

"Appendix I"
Report of the Board on Heavy Ordnance and Projectiles.

12-INCH M. L. RIFLED MORTAR — 12½ TONS.

Cast Iron, Hooped with Steel

Scale 1/10.



Cast Iron.....

Steel.....

Weight of Cast Iron.....17925 lbs.

.....„.....„...Steel Hoops.....10513 „..

Total Weight....28438 lbs.

Charge.

50 to 55 lbs.

Shell.

500 to 550 lbs.

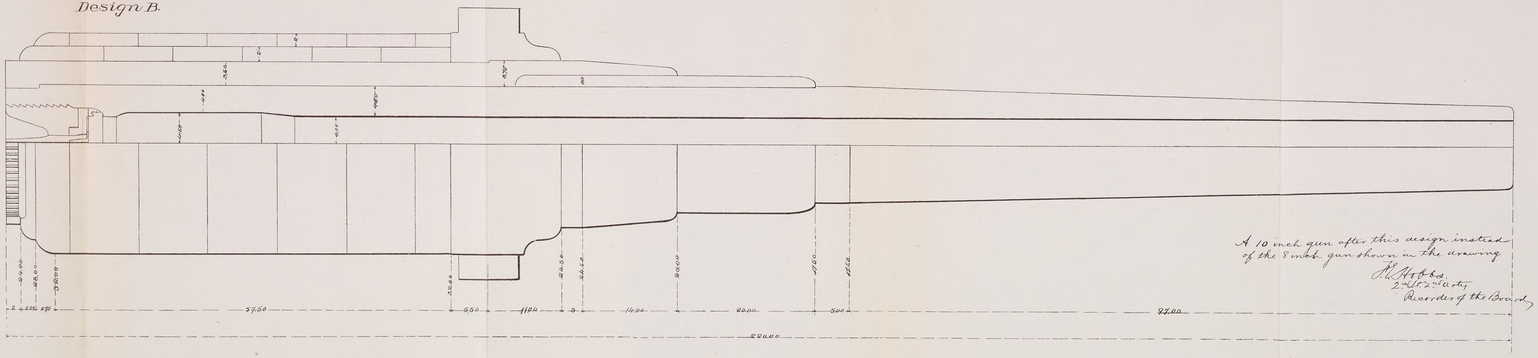
Appendix I

Report of the Board on Heavy Ordnance & Projectiles.

8 Inch and 10 Inch Breech-loading Steel Rifles.

So. Boston Iron Co.

Design B.



A 10 inch gun after this design instead of the 8 inch gun shown in the drawing

H. Metcalf
2d Lieut 2nd Artly
Recorder of the Board

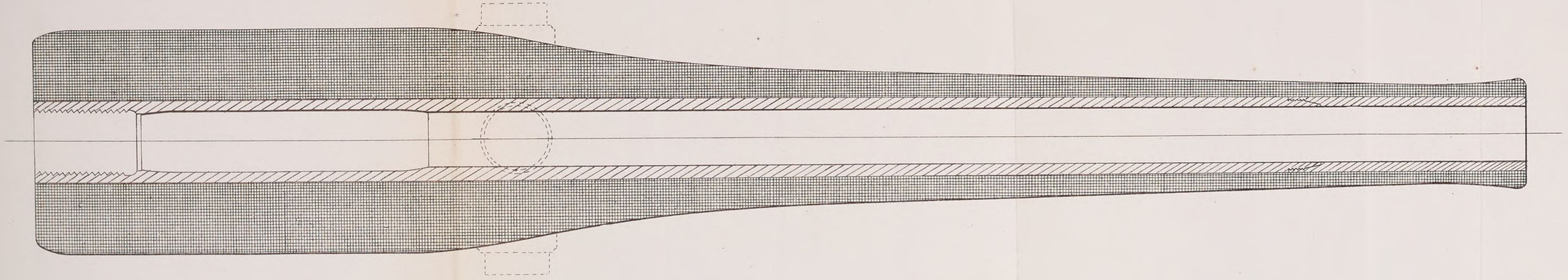
8 inch and 10 inch B.L. Steel Rifles.

S.B.I.Co.

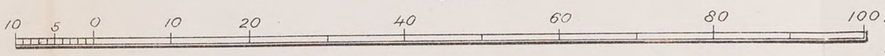
	8 inch.	10 inch.
Total weight of guns.	10 tons	14 tons
Total length of guns	220 inches	275 inches
Length of bore and chamber	208 inches	261 inches
Pitch of Rifling at breech	1 in. 40	1 in. 46

PROPOSED 10-INCH BRAZED GUN, WITH FRANKFORD ARSENAL TUBE

BY W. E. WOODBRIDGE.



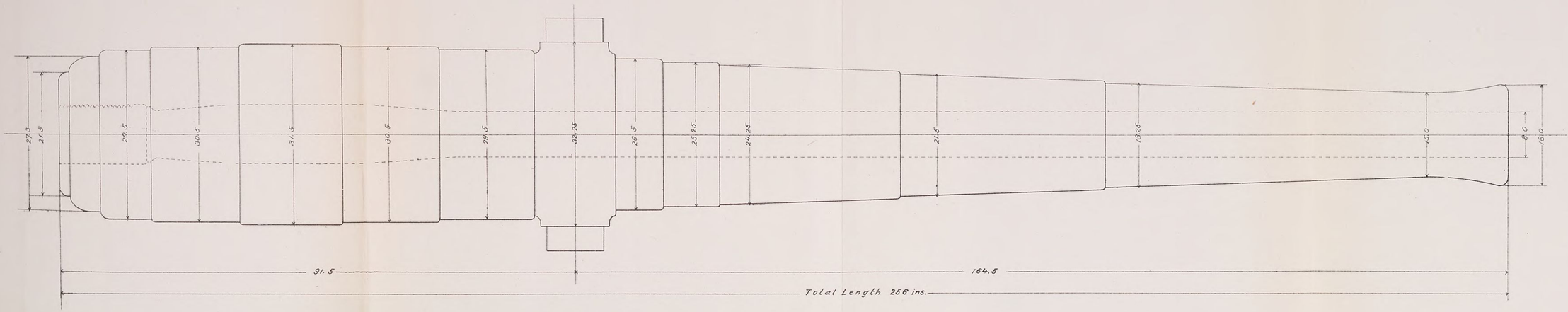
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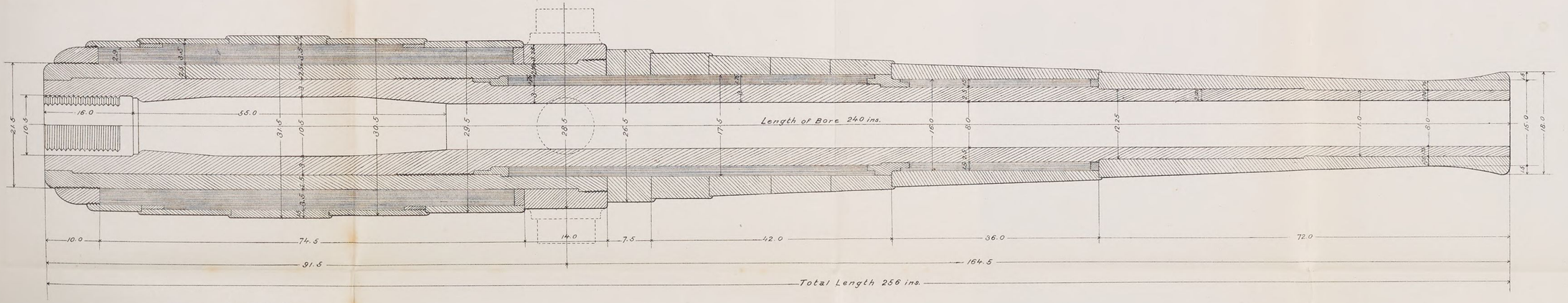


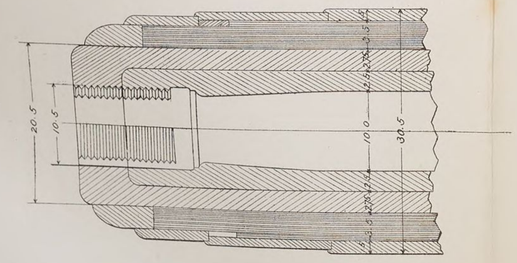
Appendix I.
Report of the Board on Heavy Ord^ce Projectiles

R

8-INCH STEEL WIRE GUN — 12 TONS.







LEGEND.

Jacket and Hoops put on under shrinkage.
Steel Wire wrapped under tension.

Charge.	Projectile.
125 lbs.	200 lbs.

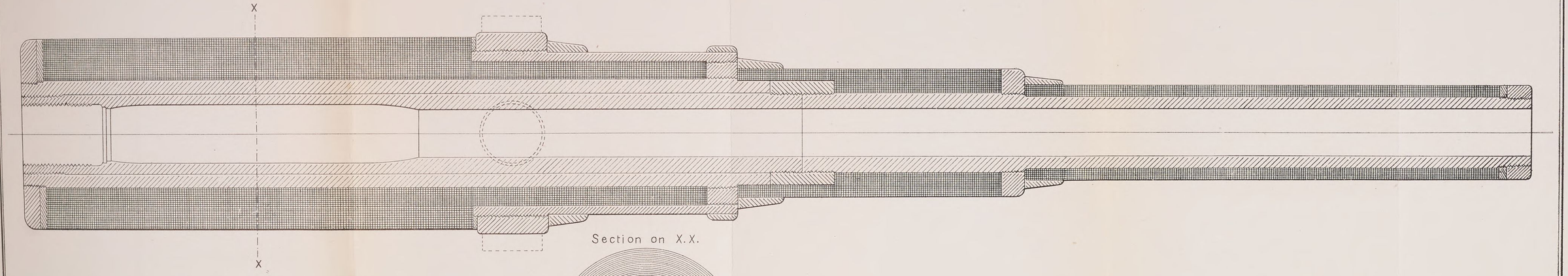
Scale:
10 5 0 10 20 30 40 50 60 Inches.

"Appendix I"
Report of the Board on Heavy Ordnance and Projectiles.

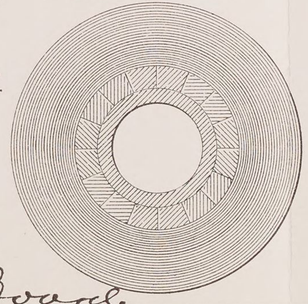
12-INCH STEEL GUN. LONGITUDINAL BARS: WIRE-WOUND. 30 CALS.

Wire-soldered.

PROPOSED BY W. E. WOODBRIDGE.



Section on X.X.



A 10 Inch gun after this design instead of the 12 inch gun shown in the drawing.

J. E. Hobbs.
2nd Lt. 2nd Artly.
Recorder of the Board.

Scale:

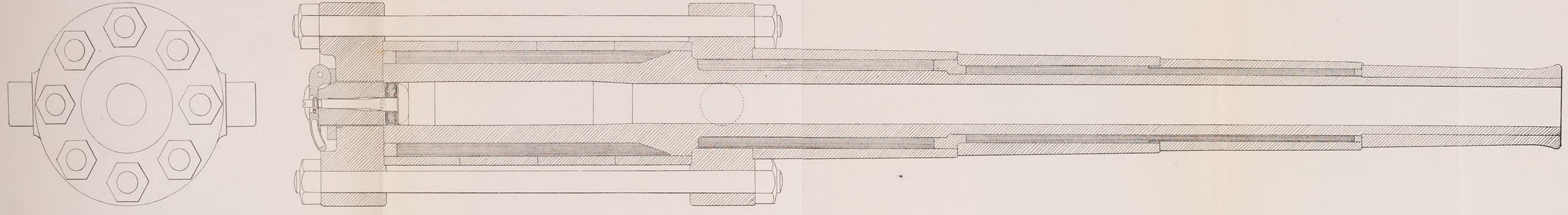


Appendix I.
Report of the Board on Heavy Ordnance & Projectiles

SKETCH OF PROPOSED 9 INCH WIRE WRAPPED B.L. STEEL RIFLE.

AFTER THE PLAN OF SCHULTZ FOR SECURING A DIVISION OF STRAINS.

WEIGHT 18 TONS — LENGTH OF BORE 30 CALS.



LEGEND.

Weight of Rods (approx)	2	Tons.
" " Tube "	3 3/4	"
" " Trunnion Block "	2 3/8	"
" " Breech " "	2 7/8	"
" " Wire and Bands "	7	"
" (Total)	18	"

Appendix I
Report of the Board on Heavy Ordnance and Projectiles

REPORT

OF THE

BOARD ON HEAVY ORDNANCE AND PROJECTILES.

APPENDIX II.

RECORD OF THE PROCEEDINGS AND ADJOURNMENTS.

PROCEEDINGS OF A BOARD CONVENED "TO MAKE EXAMINATIONS OF ALL INVENTIONS OF HEAVY ORDNANCE AND IMPROVEMENTS OF HEAVY ORDNANCE AND PRJECTILES * * * * * INCLUDING GUNS NOW BEING CONSTRUCTED UNDER DIRECTION OF THE ORDNANCE BUREAU," IN CONFORMITY WITH THE ACT OF CONGRESS APPROVED MARCH 3, 1881, AND BY VIRTUE OF THE FOLLOWING ORDER:

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, May 16, 1881.

[General Orders No. 48.]

The following order from the War Department is published for the information of all concerned:

The "act making appropriations for fortifications and other works of defense, and for the armament thereof, for the fiscal year ending June 30, 1882, and for other purposes," approved March 3, 1881, provides:

"And the President is authorized to select a Board, to consist of one Engineer officer, two Ordnance officers, and two officers of Artillery, whose duty it shall be to make examinations of all inventions of heavy ordnance and improvements of heavy ordnance and projectiles that may be presented to them, including guns now being constructed or converted under direction of the Ordnance Bureau, and said Board shall make detailed report to the Secretary of War, for transmission to Congress, of such examination, with recommendation as to what inventions are worthy of actual test, and the estimated cost of such test; and the sum of twenty-five thousand dollars, or so much thereof as may be necessary. is hereby appropriated for such purpose."

In conformity with the foregoing act a Board of officers will assemble at the Army Building, New York City, on the 13th day of July, 1881, for the purpose of making examinations of all inventions referred to in the law, and making a detailed report of such examinations, with recommendation as to what inventions are worthy of actual test, and the estimated cost of such test.

Detail for the Board.—Bvt. Maj. Gen. George W. Getty, colonel Third Artillery; Col. Z. B. Tower, Corps of Engineers; Col. J. G. Benton, Ordnance Department; Maj. A. R. Buffington, Ordnance Department; Maj. John Mendenhall, First Artillery.

Second Lieut. Frank E. Hobbs, Second Artillery, will report to the president of the Board for duty as recorder.

The Chief of Ordnance will furnish the Board with all the information on the subject in his possession; and all persons interested in such inventions are invited to submit to the Board plans, specifications, and models, mode of construction, cost, &c.

By command of General Sherman.

R. C. DRUM,
Adjutant-General.

Official:
H. C. CORBIN,
Assistant Adjutant-General.

The Board met, pursuant to the foregoing order, at the Army Building, New York City, at 1 o'clock p. m., July 13, 1881.

Present: All the members and the recorder.

The order convening it having been read, the Board entered into a discussion as to the extent, meaning, and scope of the act under which it was convened, and the proper mode of disbursement of the money therein appropriated, and the president was requested to address a letter to the Adjutant-General, U. S. A., asking an interpretation of the act. (Letter-book No. 4.)

The president was also requested to ask for authority to adjourn from time to time, &c. (Letter-book No. 3.)

The Board then proceeded to the consideration and examination of plans presented to it in its correspondence, viz:

The plan and description of a gun and fortification presented by Mr.

John Robbins, of Du Quoin, Ill. (L. R. No. 1); and the following resolution was unanimously adopted in reference thereto:

That the Board does not find sufficient merit in Mr. John Robbins' proposed system of gun construction to recommend it for actual test.

Mr. Robbins so informed. (Letter-book No. 6.)

The drawings and specifications of gun and projectile presented by Mr. Jos. Harris, jr., of Boston, Mass. (L. R. No. 2); and the following resolution was unanimously adopted:

That the Board does not find sufficient merit in Mr. Jos. Harris' proposed projectile or system of gun construction to recommend them for actual test.

Mr. Harris so informed. (Letter-book No. 7.)

The description by Dr. John McNulty of his "gun for sowing buckshot" (L. R. No. 3); and the following resolution was unanimously adopted:

That this paper be respectfully returned, as the matter does not come within the scope of the investigations of the Board.

Dr. McNulty informed of this resolution and his papers returned. (Letter-book No. 8.)

The statements of Mr. H. Caudwell, of Warborough, Wallingford, England (L. R. No. 4), as to the priority of his claim for the invention of air chambers; and the following resolution was unanimously adopted:

That as this is a question of priority of invention, the Board does not regard it as within the scope of its investigations.

Mr. Caudwell so informed. (Letter-book No. 9.)

The plan of a gun invented by Mr. Alfred Schroeder, of Omaha, Nebr. (L. R. No. 5), presented by Mr. Thomas Gibson, his attorney, who was present and explained the gun to the Board. The following resolution was unanimously adopted in reference thereto:

That as it appears from the copy of letters patent submitted the system would not be applicable to heavy ordnance, the Board decides that it does not come within the scope of its investigations.

Mr. Gibson so informed. (Letter-book No. 2.)

The plan of Mr. A. W. Kercheval, of Romney, W. Va. (L. R. No. 6), for the simultaneous discharge of heavy guns, and the defense of harbors; but without action thereon the Board adjourned, to meet the 14th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, July 14, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The Board then proceeded to consider Mr. Kercheval's plans; and the following resolution was unanimously adopted:

That Mr. Kercheval presents no detailed design, nor description of a heavy gun or projectile for examination by the Board, nor do his general remarks offer anything specific for its consideration. His papers are therefore returned, agreeably to his request.

Mr. Kercheval informed of this resolution and his papers returned. (Letter-book No. 10.)

A letter from Mr. N. G. Safford, of Saint Albans, Vt. (L. R. No. 7), asking for information, was read and filed.

A letter from Mr. John R. Tillett, of Manassas, Va. (L. R. No. 8), stating that his drawings, &c., would be sent to the Board, was read and filed.

A letter from Mr. D. K. Swisher, of Greenville, Ohio (L. R. No. 9), stating that his papers would be sent to the Board, was read and filed.

A letter from Mr. L. C. Cobb, of Bucyrus, Ohio (L. R. No. 11), submitting for the consideration of the Board his plan for rifling cannon, was read and laid aside for future action.

A letter from Mr. C. S. Ridgway, of Boston, Mass. (L. R. No. 10), asking when he could present his father's inventions in reference to harbor defenses and fortifications, was read and laid aside for future action.

Mr. C. W. Moody, being present, explained at length the plans and model of his breech-loading gun (L. R. No. 29). The matter was laid aside for future action.

Mr. D. Fitzgerald, of New York, being present, submitted a model and description of his gun.

The matter was laid aside for future action, and the Board then adjourned, to meet the 15th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, July 15, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 13th and 14th instant having been read the Board proceeded to the further consideration of Mr. L. C. Cobb's letter (L. R. No. 11); and the following resolution was unanimously adopted:

That the Board has examined the plan for rifling cannon submitted by Mr. Cobb, in his letter of July 11, 1881, and, from previous experience with a similar system, is of the opinion that it has not sufficient merit to warrant its trial.

Mr. Cobb so informed. (Letter-book No. 11.)

The Board then proceeded to the further consideration of Mr. C. L. Ridgway's letter (L. R. No. 10); and the recorder was directed to inform Mr. Ridgway that—

As the Board is only authorized to examine inventions relating to systems of manufacture and construction of heavy ordnance and projectiles, unless the invention referred to relates strictly to these things it would not be desirable to send it on for consideration. (Letter-book No. 12.)

The consideration of Mr. Fitzgerald's design was continued; and the following resolution was unanimously adopted:

That the Board, having examined Mr. Fitzgerald's design for constructing cannon, as shown in his letter and accompanying model, is of the opinion that it is impracticable, especially for heavy cannon, and does not recommend it for test. (Letter-book No. 13.)

Mr. C. Dunderdale, of New York, personally presented and explained to the Board the plan, method of construction, &c., of the Ferris gun (L. R. No. 79). Without action the subject was laid aside for future consideration.

Mr. A. H. Emery, of New York, personally addressed the Board, requesting that it appoint some day to examine his inventions.

The Board informed Mr. Emery that he could present his plans, &c., on Wednesday, July 20.

The Board then proceeded to the consideration of subjects presented to it in its correspondence, viz:

The drawing and explanation of a projectile submitted by Mr. C. J. O'Hara, of New Orleans, La. (L. R. No. 13.)

After consideration the recorder was directed to inform Mr. O'Hara that—

Having examined his drawing and explanation the Board does not find that this matter comes within the scope of its investigations, as it refers to an incendiary composition for filling shells, rather than to a design for a projectile for heavy ordnance. (Letter-book No. 14.)

The description and cut of elevating and depressing apparatus and automatic index of elevation, invented by Mr. A. F. Potter, and submitted by Mr. S. L. Cutter, of Salinas, Cal. (L. R. No. 17.)

After consideration the recorder was directed to inform Mr. Cutter that—

This matter does not come within the scope of the Board's investigations. (Letter-book No 15.)

The model and description of a projectile, invented by Mr. A. F. Potter, and submitted by Mr. S. L. Cutter, of Salinas, Cal. (L. R. No. 16)

After consideration the matter was laid aside for future action.

Letter from Mr. E. L. Birchard, of Susquehanna, Pa. (L. R. No. 18), submitting his model of a projectile for penetrating iron-clad vessels; and the following resolution was unanimously adopted:

That the Board, having examined the model and description given of Mr. Birchard's projectile, does not think it possesses sufficient merit to recommend it for test.

Mr. Birchard so informed. (Letter-book No. 16.)

The model and description of a projectile presented by Mr. R. M. Parker, of Rockford, Ill. (L. R. No. 19)

The recorder was directed to inform Mr. Parker that—

As this shell is intended for field artillery its examination does not come within the scope of the Board's investigations. (Letter-book No. 17.)

The model, specification, and plan of a projectile invented and presented by Mr. F. W. Frampton, of Philadelphia, Pa. (L. R. Nos. 20 and 50); and the following resolution was unanimously adopted:

That the Board has examined the model of a projectile submitted by Mr. Frampton, and is of the opinion that, in simplicity of construction and certainty of operation, it is inferior to the present service projectiles.

Mr. Frampton so informed. (Letter-book No. 18.)

The model and specification of a cannon and plan for aiming heavy guns submitted by Mr. Joseph Bolt, of Trexler, Pa. (L. R. Nos. 21 and 22.)

After consideration the recorder was directed to inform Mr. Bolt that—

The Board has examined his inventions, as shown in his letters and accompanying models, and is of the opinion that they are not suited for heavy ordnance. (Letter-book No. 19.)

The model and letters-patent of a projectile submitted by the inventor, Mr. T. D. Gibson, of Wilmington, Del. (L. R. Nos. 23 and 55.)

After examination the recorder was directed to inform Mr. Gibson, that—

In the opinion of the Board his projectile is not suitable for use with heavy ordnance. (Letter-book No. 20.)

The model and letters-patent of a compound explosive projectile submitted by the inventor, Mr. F. A. Markley, of Waynesborough, Va. (L. R. Nos. 24 and 68.)

After examination the recorder was directed to inform Mr. Markley that—

In the opinion of the Board his projectile is entirely unsuited for use with heavy ordnance. (Letter-book No. 21.)

A letter from Mr. J. Reese, of Pittsburg, Pa. (L. R. No. 25), calling

attention to his process for making steel. Laid aside for future consideration.

Also letters from Mr. Reese (L. R. Nos. 26 and 42), calling attention to his process for the manufacture of steel cannon. Laid aside for future consideration.

The letters and model of a revolving cannon submitted by the inventor, Mr. J. W. Potter, of Perrysville, R. I. (L. R. No. 53.)

After examination the recorder was directed to inform Mr. Potter that—

The Board does not regard the subject of revolving cannon as within the scope of its investigations. (Letter book No. 22.)

The model of and papers relating to the projectile invented by Mr. H. H. Sibley, of Fredericksburg, Va. (L. R. Nos. 47, 48, 49, and 77.) Laid aside for future consideration.

The Board then adjourned to meet the 19th instant, at 11 o'clock a. m

---

ARMY BUILDING,
New York City, July 19, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 15th instant were read.

Mr. G. W. Turner, of Okolona, Miss., being present, explained his projectile to the Board. (L. R. No. 39.)

He was informed that as his projectile was intended for field artillery only, its consideration did not come within the scope of the Board's investigations.

The following letter from the Adjutant-General was read and filed. (L. R. No. 88):

HEADQUARTERS OF THE ARMY, ADJUTANT-GENERAL'S OFFICE,
Washington, July 18, 1881.

Bvt. Maj. Gen. GEORGE W. GETTY, U. S. A.,
President of the Board on Heavy Ordnance and Projectiles,
Army Building, New York City:

SIR: I am directed by the General of the Army to inform you that the Board on Heavy Ordnance and Projectiles, appointed in General Orders No. 48, c. s., from this office, is authorized to adjourn from time to time, and to visit such places as may be deemed expedient. The actual cost of such journeys will be paid from and charged to the appropriation of $25,000 made in the act approved March 3, 1881.

I am, sir, very respectfully your obedient servant,

GEORGE D. RUGGLES,
Assistant Adjutant-General in charge.

Letters from Mr. J. E. Campbell, of Hamilton, Ohio (L. R. No. 59), from Mr. J. Bolt, of Trexler, Pa. (L. R. No. 63), and from Mr. A. W. Kercheval, of Romney, W. Va. (L. R. Nos. 6 and 51), were read and filed.

A letter from Dr. J. H. McLean, of Saint Louis, Mo. (L. R. No. 84), was read and filed.

The Recorder was directed to inform Dr. McLean that he can submit the model, description, &c., of his cannon, when he desires. (Letter-book No. 24.)

A letter from Mr. W. W. Hanes, of Covington, Ky. (L. R. No. 74), was read and filed.

The Recorder was directed to inform Mr. Hanes that he need not appear before the Board in person, but that any models, descriptions, and specifications of his inventions might be submitted if he desired. (Letter-book No. 26.)

The Board then resumed the consideration of the model of and papers relating to the projectile invented by Mr. H. H. Sibley, of Fredericksburg, Va. (L. R. Nos. 47, 48, 49, and 77); and the following resolution was unanimously adopted:

That the Board has examined the several communications of Mr. H. H. Sibley and the accompanying model, and is of the opinion that his proposed projectile does not possess that strength and simplicity of construction which would make it effective against armor plates and other objects of great resistance. It does not therefore recommend it for actual test.

Mr. Sibley so informed. (Letter-book No. 27.)

The Board then proceeded to the consideration of the matter presented to it in its correspondence, viz:

The plan and specification of an improved method of constructing ordnance, presented by Mr. J. R. Tillett, of Manassas, Va. (L. R. Nos. 8 and 37.)

The recorder was directed to inform Mr. Tillett that—

In the opinion of the Board his plan does not possess sufficient merit to warrant a recommendation for its actual test. (Letter-book No. 29.)

A plan for strengthening cast-iron guns, submitted by Mr. John Groves, of Patterson, N. J. (L. R. No. 35); and the following resolution was unanimously adopted:

That the Board has examined Mr. John Groves's plan for strengthening cast-iron guns, as set forth in his letter to the Chief of Ordnance of July 26, 1876, and does not perceive in it sufficient merit to recommend it for actual test.

Mr. Groves so informed. (Letter-book No. 30.)

The drawing of a case-shot, presented by Mr. H. Studer, of Manchester, England (L. R. No. 33); and the following resolution was unanimously adopted:

That the Board has examined the drawing of a case-shot submitted by Mr. H. Studer, of the Swiss Artillery, as set forth in his letter of June 3, 1873, to the Chief of Ordnance, and is of the opinion that his proposed projectile possesses no advantages over projectiles of this class now in the service, and, as it is designed for field artillery alone, does not come within the scope of its investigation.

Mr. Studer so informed. (Letter-book No. 32.)

The drawing of a projectile submitted by Mr. E. W. Dunlap, of Trenton, N. J. (L. R. No. 32); and the following resolution was unanimously adopted:

That the Board, having examined Mr. Dunlap's drawings, as given in his letter to the Chief of Ordnance, is of the opinion that his proposed projectile is not as well suited for ordnance of large caliber as those now in the service, and does not therefore recommend it for actual test.

Mr. Dunlap so informed. (Letter-book No. 34.)

The model, plan, and specifications of a breech system for cannon, submitted by Mr. C. W. Moody, of Indianapolis, Ind. (L. R. No. 29); and the following resolution was unanimously adopted.

That the Board has examined the description and model of Mr. C. W. Moody's breech system for ordnance, and is of the opinion that it is not well suited for cannon of large caliber. The Board does not, therefore, recommend it for actual test.

Mr. Moody so informed. (Letter-book No. 36.)

A method of loading ordnance at the breech, submitted by Mr. J. R. N. Owen, of Hamilton, Nev. (L. R. No. 36); and the following resolution was unanimously adopted:

That the Board has examined the method of loading ordnance at the

breech, submitted by Mr. J. R. N. Owen, and is of the opinion that it is not well suited for cannon of large caliber. The Board does not therefore recommend it for actual test.

Mr. Owen so informed. (Letter-book No. 38.)

Model, drawing, and description of breech-loading gun submitted by General I. F. Quinby, of Rochester, N. Y. (L. R. No. 43); and the following resolution was unanimously adopted in reference thereto:

That the Board has examined the model, drawing, and description of a breech-loading gun submitted by General I. F. Quinby, and is of the opinion that it is not well suited for guns of large caliber. The Board does not therefore recommend it for actual test.

General Quinby so informed. (Letter-book No. 39.)

The specifications and drawings of projectiles for field artillery, submitted by Mr. N. Y. Mayer, of Vienna, Austria. (L. R. No. 34.)

The recorder was directed to inform Mr. Mayer that this Board does not regard this matter as coming within the scope of its investigations. (Letter-book No. 40.)

The model and drawings of projectiles submitted by Mr. W. H. Cleland, of New Orleans, La. (L. R. No. 46.)

The recorder was directed to inform Mr. Cleland that—

The Board regards his plan as entirely impracticable, and does not recommend it for actual test. (Letter-book No. 41.)

The drawing of a projectile submitted by Mr. Cleveland, of Dyckesville, Wis. (L. R. No. 45.)

The recorder was directed to inform Mr. Cleveland that—

The Board is of the opinion that his method of making projectiles is entirely impracticable, and does not recommend it for actual test. (Letter-book No. 42.)

Model and description of a projectile presented by Mr. W. T. Depue, of Saint Louis, Mich. (L. R. No. 54); and the following resolution was unanimously adopted:

That the Board is of the opinion that the projectile proposed, being made of several parts, lacks the necessary strength and simplicity; and the form of the point is not as good as the ogival now in use. It does not, therefore, recommend it for actual test.

Mr. Depue so informed. (Letter-book No. 43.)

Mr. Clinton Roosevelt then appeared before the Board and read a paper for its consideration.

The Board then resumed the consideration of its correspondence, viz:

A letter from Mr. D. K. Swisher, of Greenville, Ohio (L. R. Nos. 56, 57, and 58), submitting a plan of his gun.

The recorder was directed to inform Mr. Swisher that—

The Board does not regard his plan as suitable for heavy ordnance. (Letter-book No. 45.)

The description of a magnetized steel point projectile, glazed armor plate, &c., submitted by Mr. E. J. Couch, of Grand Junction, Iowa. (L. R. Nos. 60, 61, and 62.)

The recorder was directed to inform Mr. Couch that—

The Board regards his plan as entirely impracticable, and does not, therefore, recommend it for actual test. (Letter book No. 46.)

A plan for constructing heavy ordnance, submitted by Mr. D. G. Smith, of Carbondale, Pa. (L. R. No. 66.)

The recorder was directed to inform Mr. Smith that—

The Board does not recommend his plan for actual test. (Letter-book No. 47.)

The letters from Mr. H. B. Anderson, of Saint Louis, Mo. (L. R. Nos. 64 and 65), in reference to his inventions.

The recorder was directed to notify Mr. Anderson that—

In the opinion of the Board, his inventions are not applicable to breech-loading cannon. (Letter-book No. 48.)

The drawing and description of a projectile, submitted by Mr. J. D. Richards, of Lettsville, Iowa. (L. R. No. 69.)

The recorder was directed to inform Mr. Richards that—

His projectile is not suited for heavy ordnance. (Letter-book No. 49.)

The models and descriptions of cannon and projectiles submitted by Mr. J. F. Jeter, of Cross Plains, Ala. (L. R. No. 72.)

After consideration the following resolution was unanimously adopted:

That the Board does not find sufficient merit in Mr. Jeter's plans for cannon and projectiles to recommend them for actual test.

Mr. Jeter so informed. (Letter-book No. 50.)

The letters from Mr. A. G. Safford, of Saint Albans, Vt., submitting model of Amos Newport's shell. (L. R. Nos. 7 and 80.)

The recorder was directed to inform Mr. Safford that—

The proposed projectile being a spherical case shot, the Board does not regard this matter as coming within the scope of its investigations. (Letter-book No. 51.)

A letter from Mr. T. D. Gibson, of Wilmington, Del. (L. R. No. 81), was read and filed.

A letter from Mr. S. S. Powers, of Postville, Iowa, transmitting the ordnance inventions of Mr. C. B. Guy. (L. R. No. 82.)

After consideration the following resolution was unanimously adopted:

That the Board has examined the several small models of guns and projectiles submitted by Mr. Powers for Mr. Guy, and is of the opinion that the plans therein embodied are impracticable, and does not recommend them for actual test.

Mr. Powers so informed. (Letter-book No. 52.)

A letter from Mr. G. Leverich, of South Orange, N. J., to the President of the Board (L. R. No. 90), offering to communicate to the Board his knowledge of the Thompson gun.

The recorder was directed to inform Mr. Leverich that if his presence is desired he will be notified of the fact. (Letter-book No. 25.)

The plan proposed by Mr. D. Warner, of London, Ohio (L. R. No. 83), for increasing the range of projectiles.

After examination, the following resolution was unanimously adopted:

That the Board has examined Mr. D. Warner's models and description of his plan for increasing the range of projectiles, and is of the opinion that it is wrong in principle and does not recommend it for actual test.

Mr. Warner so informed. (Letter-book No. 54.)

The following resolution was unanimously adopted:

That the recorder be authorized to hire a clerk at a salary not to exceed $100 per month.

The Board then adjourned, to meet the 20th instant at 11 o'clock a. m

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ARMY BUILDING,
New York City, July 20, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

Mr. J. W. Buell, of Kent Cliffs, N. Y., personally appeared before the Board and submitted and explained the model of his breech system for cannon. (L. R. No. 92.)

The subject was laid aside for future consideration.

Mr. A. H. Emery, of New York, personally appeared before the Board and explained at length some of his inventions.

The proceedings of the 19th instant having been read, the Board adjourned to meet the 21st instant at 11 o'clock, a. m.

ARMY BUILDING,
New York City, July 21, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

Mr. A. H. Emery continued his remarks to the Board on the subject of his inventions.

The proceedings of the 20th instant were then read.

A letter to the president of the Board from Master Samuel Seabury, U. S. N. (L. R. No. 93), was read and filed.

The recorder was directed to inform Master Seabury that he can send his models, &c., at his convenience, and that his presence is not necessary. (Letter-book No. 56.)

Letters from Mr. Thomas D. Gibson, of Wilmington, Del. (L. R. Nos. 94 and 95), were read and filed.

The recorder was directed to inform Mr. Gibson, that a report on his shell, as to its adaptability to field artillery, cannot be be made, and that his model, shells, &c., will be returned to him as soon as they can be spared from the files of the Board. (Letter-book No. 57.)

A letter from Mr. Jos. Bolt, of Trexler, Pa. (L. R. No. 91), asking that the model of his "shooting machine" be transferred to the Board on small arms, was read and filed.

The recorder was directed to inform Mr. Bolt that this Board has no authority to transfer the models, &c., laid before it for its consideration. (Letter-book No. 58.)

The Board then adjourned, to meet the 22d instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, July 22, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 21st instant were then read.

The following letter from the Adjutant-General of the Army was read and filed. (L. R. No. 97.)

WAR DEPARTMENT,
ADJUTANT-GENERAL'S OFFICE,
Washington, July 21, 1881.

Bvt. Maj.-Gen. GEORGE W. GETTY,
President Board on Heavy Ordnance, &c.,
Army Building, New York City:

SIR: In reply to your letter of the 14th instant, I have the honor to inform you that the Secretary of War decides that the $25,000 appropriated by the act approved March 3, 1881, was to meet the current expenses of the Board and the cost of such trials as might, in the opinion of the Board, be necessary in order to gather information upon which to base the recommendations required by the act.

The Secretary concurs with the Chief of Ordnance in the opinion that this money was not intended for the final tests of inventions recommended as worthy, because, such recommendations, with estimated cost of such trials, must be submitted to Congress for its action.

Very respectfully, your obedient servant,

R. C. DRUM,
Adjutant-General.

A letter from Mr. D. Tufts, of Pittsburg, Pa. (L. R. No. 98), to Lieut. Col. A. R. Buffington, was read and filed.

The recorder was directed to notify Mr. Tufts that, as his model is quite heavy, it would be better that he submit drawings and a detailed description of his gun, and the model will be examined afterwards, if necessary. (Letter-book No. 59.)

A letter from Mr. Thomas D. Gibson, of Wilmington, Del., to the recorder (L. R. No. 96) was read and filed.

The Board suggested that the recorder reply to Mr. Gibson. (Letter-book No. 60.)

A letter from Mr. H. F. Mann, of Pittsburg, Pa., to the President of the Board (L. R. No. 85), was read and filed.

The recorder was directed to inform Mr. Mann that he can submit his drawings, specifications, &c., as soon as practicable. If his presence is desired he will be notified. (Letter-book No. 61.)

Mr. D. Fitzgerald personally addressed the Board on the subject of his inventions (L. R. No. 30), and also presented a model of another gun.

Mr. Fitzgerald was informed that his plans were not considered suitable for guns of large caliber and could not be recommended for actual test.

Mr. Fitzgerald withdrew his models and papers (L. R. No. 30) from the files of the Board.

Mr. A. H. Emery continued his remrks to the Board on the subject of his inventions.

The Board then adjourned to meet the 26th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, July 26, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

Mr. A. H. Emery, being present, concluded his remarks to the Board on the subject of his inventions; being plans for converting 10-inch and 15-inch guns, and constructing new guns of large caliber. Mr. Emery also made propositions to the Board in reference to certain preliminary experiments and was informed that he would be answered to-morrow, the 27th instant.

The proceedings of the 22d instant were then read.

The Board then proceeded to the consideration of its correspondence, viz:

The plans, specifications, correspondence, &c., in relation to sea-coast fortifications, and his cast-iron guns of large caliber, submitted by the Chief of Ordnance for Mr. Norman Waird. (L. R. No. 103.)

Laid aside for future consideration.

The plans and specifications of ordnance, and an improved method of casting, submitted by Mr. William Wheeler Hubbell, of Philadelphia, Pa. (L. R. No. 102).

Laid aside for future consideration.

A letter from Mr. G. Leverich, of South Orange, N. J., to the President of the Board (L. R. No. 99), stating what important points in regard to the Thompson gun he desires to explain to the Board was read and filed.

A letter from Dr. J. H. McLean's secretary (L. R. No. 100), asking if

Dr. McLean's presence was necessary before the Board, or whether his model should be sent, was read and filed.

The recorder was directed to inform Dr. McLean that it would be better that he submit the plans, specifications, mode of construction, and cost of his gun, and, if necessary, the model will be examined later. If his presence is necessary he will be informed of the fact. (Letter-book, No. 68.)

The drawings, specifications, and patent papers of a percussion shell, submitted by Mr. W. W. Hanes, of Covington, Ky. (L. R. No. 101.)

Laid aside for future consideration.

A letter from Mr. F. W. Frampton, of Philadelphia, Pa. (L. R. No. 104), giving directions as to the disposition of his models, &c., was read and filed. (Letter-book No. 74.)

A letter from Mr. R. M. Parker, of Rockford, Ill. (L. R. No. 105), giving directions as to the disposition of his model, &c., was read and filed. (Letter-book No. 71.)

A letter from Mr. C. Dunderdale, of New York (L. R. No. 109), submitting further arguments on the Ferris gun system, read and filed with previous papers for future consideration.

Letters from Mr. William Davis, of Enfield Wash, England (L. R. Nos. 107 and 108), stating that he had sent by mail a box containing a model of a projectile he desired should be considered, were read and filed.

A letter from Mr. H. H. Sibley, of Fredericksburg, Va. (L. R. No. 106), submitting model and letters patent of Mr. E. J. Seaburn's invention for lifting and carrying heavy weights.

The recorder was directed to inform Mr. Sibley that the consideration of Mr. Seaburn's invention does not come within the scope of the Board's investigations, which are confined strictly to inventions of heavy ordnance and projectiles. (Letter-book No. 73.)

A letter from Mr. J. R. Tillett, of Manassas, Va. (L. R. No. 111), was read and filed. (Letter-book No. 62.)

A letter from Mr. Jos. Harris, of Boston, Mass. (L. R. No. 112), suggesting the idea of a gun with a bore of octagonal shape.

The recorder was directed to inform Mr. Harris that, from previous experience with similar systems of rifling, the Board does not regard the plan as having sufficient merit to warrant a recommendation for trial. (Letter-book No. 75.)

The plans and descriptions of gun, projectile, and fuse submitted by the inventor, Master Samuel Seabury, U. S. N. (L. R. No. 110.)

Laid aside for future consideration.

The Board then adjourned to meet the 27th instant, at 11 o'clock, a. m.

ARMY BUILDING,
New York City, July 27, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 26th instant were then read.

The recorder was directed to inform Mr. Hubbell, in answer to his letter of the 23d instant (L. R. No. 102), that he can appear before the Board at any time. (Letter-book No. 76.)

The plans, description, &c., of the Ferris gun submitted by Mr. C. Dunderdale, of New York (L. R. Nos. 28, 79, 89, and 109), were considered and laid aside for future action.

Mr. Willis E. Ball, of Cold Spring, N. Y., then submitted his plans, &c., of gun and projectile (L. R. No. 113), and personally explained them to the Board.

Mr. Ball was informed by the Board that his plans were not considered applicable to heavy ordnance and projectiles, and could not be recommended for actual test. (Models and plans withdrawn by Mr. Ball.)

The model, description, and letters patent of breech-loading ordnance submitted by Mr. Theo. Yates, of Milwaukee, Wis. (L. R. No. 78), were then considered, and the following resolution was unanimously adopted:

That the Board has examined the model, description, &c., of Mr. Yates's breech-loading ordnance, and is of the opinion that the breech-loading device does not possess sufficient merit to warrant its actual test.

Mr. Yates so informed. (Letter-book No. 77.)

Mr. M. Stafford, of New York City, personally presented and explained to the Board a model of a shot of his invention, being a design to give rotary motion to projectiles fired from smooth bore guns. He was informed that the Board did not think his plan possessed sufficient merit to warrant its test. (Model withdrawn by Mr. Stafford.)

Mr. A. H. Emery, of New York, then personally appeared, and was informed that in reference to his propositions of the 26th instant the following resolution had been unanimously adopted:

That Mr. A. H. Emery be informed that his propositions in reference to certain preliminary experiments cannot be acted upon definitely until the Board has made a more thorough examination of all the plans, projects, &c., submitted to it.

Mr. Emery addressed the Board in reference to his propositions.

The Board then adjourned to meet the 28th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, July 28, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 27th instant were then read.

The Board then proceeded to the consideration of the matter presented to it in its correspondence, viz:

A letter from Mr. J. R. Haskell, of New York (L. R. No. 114), submitting a copy of the drawing of the 6-inch "Lyman-Haskell accelerating or multicharge" gun, and asking how much time he could have to submit further drawings, &c.

Laid aside for future consideration, and the recorder directed to inform Mr. Haskell that he can have until October to submit his drawings, &c., and suggest that he give plans, specification, mode of construction, and cost of a 12-inch gun. (Letter-book No. 85.)

A letter from Mr. A. G. Safford, of Saint Albans, Vt. (L. R. No. 115) giving directions as to the disposition of Amos Newport's models.

Read and filed. (Letter-book No. 84.)

A letter from Mr. D. Warner, of London, Ohio (L. R. No. 117), giving directions as the disposition of his papers.

Read and filed. (Letter-book No. 83.)

Letter from Mr. Jos. Bolt, of Trexler, Pa. (L. R. No. 116), asking for certain information.

Read and filed. (Letter-book No. 81.)

A letter from Dr. W. E. Woodbridge, of Boston, Mass. (L. R. No. 118), presenting pamphlet on his plan of gun construction.

Read and laid aside for future consideration.

A letter from Mr. Jos. Bolt, of Trexler, Pa. (L. R. No. 91), submitting model, drawing, and specification of a projectile.

The recorder was directed to inform Mr. Bolt that the Board does not think the projectile as good as canister and shrapnel now in use and, as it is not suitable for guns of large caliber, does not recommend it for actual test. (Letter-book No. 80.)

A letter from Mr. C. B. Mason, of Sumter, S. C. (L. R. No. 86), submitting his plan of heavy ordnance.

After examination the following resolution was unanimously adopted:

That the Board has examined the models and description of Mr. Mason's plan for construction of heavy ordnance, and not regarding it as suitable for guns of large caliber, does not recommend it for actual test.

Mr. Mason so informed. (Letter-book No. 79.)

A letter from Mr. W. W. Hanes, of Covington, Ky. (L. R. No. 101), submitting drawings, specifications, and letters patent of his percussion shell.

The recorder was directed to inform Mr. Hanes that, in the opinion of the Board, his projectile is not suitable for use with guns of large caliber. (Letter-book No. 88.)

Papers returned to Mr. Hanes as requested.

A letter from Mr. T. N. Hornsby, of Simpsonville, Ky. (L. R. No. 52), submitting plans and description of projectile and scroll gun.

After consideration, the following resolution was unanimously adopted:

That the Board has examined the models, plans, and description of a projectile and scroll gun submitted by Mr. Hornsby, and, from experience with similar projectiles, is of the opinion that his plan for giving rifled motion is impracticable. The system of gun construction is not thought to be applicable to guns of large caliber, and is not therefore recommended for actual test.

Mr. Hornsby so informed. (Letter-book No. 86.)

A letter from Mr. J. W. Blake, of Marshall, Minn., transmitted by Hon. Wm. Windom (L. R. No. 44), inclosing description of his system of gun construction.

After consideration the following resolution was unanimously adopted:

That, in the opinion of the Board, Mr. Blake's system is not a suitable one for gun construction, and is not recommended for actual test.

Mr. Blake so informed. (Letter-book No. 89.)

The model and description of a projectile invented by Mr. A. F. Potter, and submitted by Mr. S. L. Cutter, of Salinas, Cal. (L. R. No. 16), taken up for further consideration, and the following resolution was unanimously adopted:

That the Board, having examined Mr. Potter's projectile, is of the opinion that it is not suitable for use with guns of large caliber.

Mr. Cutter so informed. (Letter-book No. 90.)

A letter from Mr. L. W. Broadwell, of Döbling, Austria (L. R. No. 31), transmitted to the Board by the Chief of Ordnance, giving tracing and description of 11-inch steel built up B. L. rifled gun.

After consideration the following resolution was unanimously adopted:

That the Board does not recommend Mr. Broadwell's plan for actual test.

Mr. Broadwell so informed. (Letter-book No. 91.)

A letter from Mr. S. B. Dean, of Boston, Mass. (L. R. No. 75), submitting plans and description of his gun.

Laid aside for future consideration.

A letter from Mr. F. A. Dennette, of Boston, Mass. (L. R., Nos. 38 and 76), submitting plans and description of his projectile.

After consideration, the following resolution was unanimously adopted:

That the Board, having examined the plans of projectiles submitted by Mr. F. A. Dennette, is of the opinion that they possess no advantages over projectiles already in use, and does not therefore recommend them for actual test.

Mr. Dennette so informed. (Letter-book No. 92.)

Mr. Norman Wiard's plans, specifications, correspondence, &c., in relation to sea-coast fortifications and heavy guns (L. R., No. 103) were taken up, but, without completing their consideration, the Board adjourned, to meet the 29th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, July 29, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 28th inst. were then read.

A letter from Mr. H. F. Mann, of Pittsburgh, Pa. (L. R. No. 119) was read and filed.

The recorder was directed to inform Mr. Mann that unless he can appear before the Board next week he had better defer his visit until after the 1st of October. (Letter-book No. 93.)

A letter from Mr. H. H. Sibley, of Fredericksburgh, Va. (L. R. No. 120), giving directions as to the disposition of Mr. Seaburn's model, was read and filed.

The consideration of Mr. Norman Wiard's plans, propositions, &c., was continued, and the papers finally laid aside for future consideration.

After an extended discussion on various plans for future action, the Board adjourned, to meet the 1st proximo, at 11 o'clock a. m.

ARMY BUILDING,
New York City, August 1, 1881.

The Board met, pursuant to adjournment, at 11.15 o'clock a. m.

Present: All the members and the recorder.

Mr. William Wheeler Hubbell, of Philadelphia, Pa., personally addressed the Board on the subject of his method of making cast iron for gun construction and his breech-loading ordnance.

The proceedings of the 29th ultimo were then read.

A letter from Mr. C. J. O'Hara, of New Orleans, La. (L. R. No. 124), claiming great superiority of his shell, was read and filed.

A letter from Mr. C. W. Moody, of Indianapolis, Ind. (L. R. No. 125), submitting further arguments in favor of his gas check, was read and filed.

The recorder was directed to inform Mr. Moody that the Board adheres to its decision, in regard to his inventions, communicated to him in letter of the 20th ultimo. (Letter-book No. 98.)

Letters from Mr. Theo. Yates, of Milwaukee, Wis. (L. R. No. 123), and from Mr. F. W. Frampton, of Philadelphia, Pa. (L. R. No. 122), giving directions as to the disposition of their models, &c., were read and filed. (Letter-book Nos. 97 and 99.)

The Board then proceeded to the consideration of Mr. Hubbell's plans as set forth in his letters patent, pending which the Board adjourned to meet the 2d instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, August 2, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 1st instant were then read.

Mr. D. L. Kennedy, of New York City, submitted a model of his spiral drill-pointed projectile (L. R. No. 127), and personally explained its features and advantages to the Board.

The matter was laid aside for future consideration.

Mr. R. R. Moffatt, of Brooklyn, N. Y., personally submitted the drawings and description of his plan of heavy ordnance construction (L. R. No. 126) and explained them to the Board.

The matter was laid aside for future consideration.

The letters from Mr. J. Reese, of Pittsburg, Pa. (L. R. Nos. 25 and 26), were taken up for further consideration, and the recorder was directed to request Mr. Reese to submit definite plans and information to the Board. (Letter-book No. 100.)

After further general discussion of the plans before it, the Board adjourned to meet the 3d instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, August 3, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

Dr. W. E. Woodbridge, of Boston, Mass., personally appeared before the Board and explained at length the plan and method of constructing his 10-inch M. L. rifled wire gun.

The Board then adjourned to meet the 4th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, August 4, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 2d and 3d instant were then read.

After some general discussion of the various plans before it, the following resolution was unanimously adopted:

That, in view of the proposition of Colonel Laidley, the Chief of Ordnance be asked to furnish this Board all information—that is, history, records of firing, pressures, velocities, &c.—relative to and tests for endurance of cast-iron guns, especially rifled guns of 8-inch caliber and

upwards; also any reports of and experiments made by Colonel Laidley to test the value of cast iron as a material for heavy construction. (Letter-book No. 101.)

Dr. W. E. Woodbridge, of Boston, Mass., personally appeared before the Board and exhibited and explained drawings of a projectile of his invention.

The Board then continued the consideration of Dr. Woodbridge's gun, and the following resolution was unanimously adopted:

That the Woodbridge 10-inch M. L. rifle, now at Sandy Hook, N. J., in possession of the Ordnance Department, be fired under supervision of the Board at least 100 rounds—records giving measurements of bore, velocities, pressures, &c., being kept—in order that it may obtain all possible information before action on the system proposed by Dr. Woodbridge; and that the Chief of Ordnance be requested to extend to the Board all necessary facilities for conducting the aforesaid experiments at Sandy Hook proving grounds, the expense of the same to be paid for out of the money appropriated for that purpose. (Letter-book No. 102.)

The Board then adjourned to meet the 5th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, August 5, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 4th instant were then read.

A letter from Mr. C. B. Mason, giving directions as to the disposition of his model (L. R. No. 131), was read and filed.

Mr. A. H. Emery, of New York, then addressed the Board in regard to his propositions for the comparative test of systems of gun construction, and the following resolution was unanimously adopted:

Resolved, That the Board obtain from Mr. A. H. Emery, of New York, drawings of ten different systems of heavy gun construction, each giving section of entire gun through axis, and sections of one and one-half calibers in length at six different points; also, section of a model of the breech for machine and powder test, as explained and shown in drawing exhibited this day; and also an approximate estimate of the cost of the models and sections made after the drawings; and that the sum of $1,000—$100 per set—be paid for said drawings and estimates out of the money appropriated for the expenses of the Board.

Mr. Emery informed of this resolution and requested to state whether he can make the drawings and estimates on the terms mentioned, and when they will be furnished. (Letter-book No. 104.)

The Board then adjourned to meet the 9th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, August 9, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 5th instant were then read.

A letter from Mr. G. W. Turner, of Okolona, Miss. (L. R. No. 132), transmitted to the Board by the Chief of Ordnance, was read, and, after consideration of the model and description, the recorder was directed to

inform Mr. Turner that his projectile is not regarded as suitable for use with guns of large caliber, and that the subject of port-fires is not within the scope of the Board's investigations. (Letter-book No. 111.)

A letter from Dr. J. H. McLean, of Saint Louis, Mo. (L. R. No. 133), stating that he had made arrangements with the South Boston Iron Company to receive the model and drawings of his 100-ton gun, was read and filed.

The recorder was directed to inform Dr. McLean that the Board would probably visit the South Boston Foundry some time in October, and would then examine his model, &c. (Letter-book No. 117.)

A letter from Mr. J. W. Blake, of Marshall, Minn. (L. R. No. 135), asking how long the Board would be in session, was read and filed.

The recorder was directed to inform Mr. Blake that the Board will adjourn to-day, to meet again the 5th of October, in this city. (Letter-book No. 118.)

Letters from Mr. J. W. Blake, of Marshall, Minn. (L. R. No. 134); from Mr. F. A. Dennette, of Boston, Mass. (L. R. No. 136); and from Mr. Jos. Bolt, of Trexler, Pa. (L. R. No. 139), giving directions as to the disposition of their drawings and papers, were read and filed. (Letter-book Nos. 119, 120, and 112.)

Mr. A. H. Emery, of New York, then addressed the Board in regard to the drawings to be made by him, and accepted the proposition of the Board. (L. R. No. 137.)

A list giving the ten systems of gun construction, of which drawings were to be made, was given Mr. Emery. (Letter-book No. 108.)

The Board then adjourned, to meet the 5th of October.

ARMY BUILDING,
New York City, October 5, 1881.

The Board met, pursuant to adjournment, at 11.15 o'clock, a. m.

Present: All the members, except Col. J. G. Benton, deceased. The recorder also present.

The original order convening the Board was then read, and also the following order:

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, September 29, 1881.

[Extract.]

[Special Orders, No. 220.]

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2. By direction of the President, Maj. F. H. Parker, Ordnance Department, is detailed as a member of the Board on Heavy Ordnance, convened by General Orders. No. 48, May 16, 1881, from this office, and will report for duty accordingly.

* * * * * * *

By command of General Sherman.

CHAUNCEY McKEEVER,
Acting Adjutant-General.

Official:
H. C. CORBIN,
Assistant Adjutant-General.

The proceedings of August 9 were then read.

The following letters, received during the adjournment of the Board, were read and filed, viz:

From the Chief of Ordnance (L. R. No. 140), in reply to the Board's letter of August 4.

From Mr. H. F. Mann, of Pittsburg, Pa. (L. R. No. 143), stating that he would appear before the Board on its reassembling.

From the Chief of Ordnance (L. R. No. 145), stating that Colonel Baylor had been given instructions to make the necessary arrangements for the trial, by the Board, of the Woodbridge 10-inch M. L. rifle.

From Mr. H. Caudwell, of Warborough, England (L. R. No. 148), asking that his previous papers be reconsidered.

From Dr. J. H. McLean, of Saint Louis, Mo. (L. R. Nos. 149, 153, and 160), stating that the drawings of his 100-ton gun (Hercules) and working model of a gun built on his system are at the South Boston Iron Foundry for the inspection of the Board, and desiring to be informed when the Board visits that place.

From the Chief of Ordnance (L. R. No. 155), stating that certain books containing information asked for in the Board letter of August 10, now at the New York Agency, are placed temporarily at the disposal of the Board.

From Mr. George Walker, consul-general at Paris, France (L. R. No. 159), transmitting certain information in reference to heavy ordnance of France.

From Mr. H. Caudwell, of Warborough, England (L. R. No. 162), in reference to his former communications.

Letters from Mr. J. Reese, of Pittsburgh, Pa. (L. R. No. 138), and from Mr. W. W. Hubbell, of Philadelphia, Pa. (L. R. No. 151), were read and laid aside for future consideration.

A letter from Mr. J. Echols, of Lynchburg, Va. (L. R. No. 146), submitting a plan for bursting shells containing coal gas, was read and considered.

The recorder was directed to inform Mr. Echols that his plan for bursting shell, not being deemed as good as the means at present employed, is not recommended for actual test. (Letter-book No. 160.)

A letter from Mr. W. Davis, of Enfield Wash, England (L. R. No. 156), relative to the model of his projectile, was read and filed. (Letter-book No. 161.)

A letter from Lieut. Col. S. Crispin, Ordnance Department (L. R. No. 144), inclosing blue prints of the plan of gun construction adopted by the Ordnance Department for the four 12-inch rifles, and several modifications of the same, with general remarks regarding each plan, &c., transmitted to the Board by the Chief of Ordnance, was then read and laid aside for future consideration.

Letters from the Chief of Ordnance (L. R. No. 150), transmitting Senate Ex. Doc. No. 4 of the special session, and a report by Capt. C. S. Smith, Ordnance Department, as requested in the Board letter of August 4; and a letter from Mr. D. Tufts, of Pittsburgh, Pa. (L. R. No. 142), transmitting drawings and description of his gun, were read and laid aside for future consideration.

Mr. A. H. Emery then exhibited seven completed drawings of gun construction, &c., of the ten to be prepared by direction of the Board, and addressed the Board at length in reference thereto.

The Board then adjourned, to meet the 6th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, October 6, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.
Present: All the members and the recorder.
The proceedings of the 5th instant were then read.

Mr. J. R. Haskell, of New York, then addressed the Board at length, in reference to the "Lyman-Haskell accelerating or multi-charge" gun. (L. R. No. 164.)

The Board then adjourned, to meet the 7th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, October 7, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 6th instant were then read.

A letter from Lieut. A. H. Russell, Ordnance Department (L. R. No. 166), stating that he had forwarded to the Board a model of a loading pan for use with the French system of fermeture, and offering to furnish drawings, was read and filed.

The recorder was directed to request Lieutenant Russell to furnish the drawings. (Letter-book No. 165.)

After discussion, the Board adjourned, to meet the 11th instant, at Sandy Hook proving ground, N. J.

SANDY HOOK, N. J.,
October 11, 1881.

The Board met, pursuant to adjournment, at 4.30 o'clock p. m.

Present: General Getty, Major Parker, and the recorder.

Absent: Colonel Tower, Lieutenant-Colonel Buffington, and Major Mendenhall; by authority of the Board.

A programme for the firing of the Woodbridge 10-inch M. L. rifled gun having been agreed upon, the Board adjourned, to meet the 12th instant.

SANDY HOOK, N. J.,
October 12, 1881.

The Board met, pursuant to adjournment.

Present: General Getty, Major Parker, Major Mendenhall, and the recorder.

Absent: Colonel Tower, and Lieutenant-Colonel Buffington; by authority of the Board.

The firing of the Woodbridge gun was commenced, and, fifteen rounds having been fired, the Board adjourned, to meet the 13th instant.

SANDY HOOK, N. J.,
October 13, 1881.

The Board met, pursuant to adjournment.

Present: General Getty, Major Parker, Major Mendenhall, and the recorder.

Absent: Colonel Tower and Lieutenant-Colonel Buffington; by authority of the Board.

The firing of the Woodbridge gun was continued, and, twenty rounds having been fired, the Board adjourned, to meet the 14th instant.

SANDY HOOK, N. J.,
October 14, 1881.

The Board met, pursuant to adjournment.

Present: General Getty, Colonel Tower, Major Parker, Major Mendenhall, and the recorder.

Absent: Lieutenant-Colonel Buffington; by authority of the Board.

The firing of the Woodbridge gun was continued, and, twenty rounds having been fired, the Board adjourned, to meet the 15th instant.

SANDY HOOK, N. J.,
October 15, 1881.

The Board met, pursuant to adjournment.

Present: General Getty, Major Mendenhall, and the recorder.

Absent: Colonel Tower, Lieutenant-Colonel Buffington, and Major Parker; by authority of the Board.

The firing of the Woodbridge gun was continued, and, thirteen rounds having been fired, the Board adjourned, to meet the 17th instant.

SANDY HOOK, N. J.,
October 17, 1881.

The Board met, pursuant to adjournment.

Present: General Getty, Major Parker, Major Mendenhall, and the recorder.

Absent: Colonel Tower and Lieutenant-Colonel Buffington; by authority of the Board.

The firing of the Woodbridge gun was continued, and, seven rounds having been fired, the Board adjourned, to meet the 18th instant.

SANDY HOOK, N. J.,
October 18, 1881.

The Board met, pursuant to adjournment.

Present: General Getty, Colonel Tower, Major Parker, Major Mendenhall, and the recorder.

Absent: Lieutenant-Colonel Buffington; by authority of the Board.

The firing of the Woodbridge gun was continued.

Eight rounds having been fired, the gun burst—a total of ninety-three rounds—ten at Frankford Arsenal, and eighty-three at Sandy Hook, under the supervision of the Board.

The record of firing, with notes, is appended to the record, marked "A."

The Board then adjourned, to meet in New York City at 11 o'clock a. m. on the 20th instant.

ARMY BUILDING,
New York City, October 20, 1881.

The Board met, pursuant to adjournment, at 11.20 o'clock a. m.

Present: All the members and the recorder.

The Board then proceeded to the consideration of its correspondence,

and the following letters were read and laid aside for future consideration, viz:

From Lieut. A. H. Russell, Ordnance Department, U. S. A. (L. R. No. 182), inclosing description and drawing of his loading pan for use with the interrupted screw system of breech fermeture, as requested by the Board, in letter of the 7th instant.

From Mr. S. B. Dean, of Boston, Mass. (L. R. No. 173), submitting model and drawing with further description of his steel gun. (Filed with previous papers.)

From Mr. W. P. Hunt, of Boston, Mass. (L. R. No. 174), submitting copies of a letter explaining his views on gun construction, with drawings.

A letter from General L. Richmond, United States consul at Rome, Italy (L. R. No. 176), transmitting copies of "L'Italia Militare," containing an article on the gun construction of Italy, was read and filed for reference.

A letter from Mr. D. M. Mefford, of Toledo, Ohio (L. R. No. 172), submitting a system of gun construction.

Read and laid aside to wait further communication from Mr. Mefford.

A letter from Mr. F. C. Smink, of Reading, Pa. (L. R. No. 177), inviting the Board to witness the casting of the Lyman-Haskell gun, on October 24, 1881.

Read, and Mr. Haskell, who appeared before the Board to urge the acceptance of the invitation, was informed verbally that the Board could not accept.

A letter from Mr. F. M. Shields, of Coopwood, Miss. (L. R. No. 169), submitting plan, specification, and description of his "life-preserving rolling ship," was read, and the recorder directed to inform Mr. Shields that the consideration of this matter does not come within the scope of the Board's investigations, which are confined strictly to inventions of heavy ordnance and projectiles. (Letter-book No. 176.)

A letter from Mr. Wm. A. Harding, of New York City (L. R. No. 175), submitting model and letters patent of Mr. Wm. Van Gieson's projectile for rifled ordnance, was read, the model and description examined, and the following resolution unanimously adopted:

That the Board having examined the model and letters patent of a projectile for rifled cannon, submitted by Mr. Harding for Mr. Van Gieson, is of the opinion that the projectile is not as good as those already in use. It does not therefore recommend it for actual test.

Mr. Harding so informed. (Letter-book No. 177.)

One of the members of the Board being under orders to change station, and the recorder having been ordered, with others, to appear before a board of ordnance officers for examination, with view to a selection for transfer to the Ordnance Department, the Board then adjourned, to meet the 16th of November.

ARMY BUILDING,
New York City, November 16, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

Mr. H. F. Mann then presented his system of gun construction to the Board, the argument in favor of its test being made by Professor Thurston, his attorney. Models, plans, and specifications withdrawn for a

few days by Mr. Mann to enable him to print the argument and present the matter complete.

The proceedings of October 20 were then read, and the Board proceeded to the consideration of its correspondence, as follows:

Copies of the letter written by the president of the Board to the Adjutant-General of the Army, asking that steps be taken to obtain through the State Department information in regard to recent French and Italian gun constructions, were then read. (Letter-book Nos. 179 and 180.)

A letter from the Adjutant-General of the Army (L. R. No. 195), furnishing copies of letter of the honorable the Secretary of War and reply of the honorable the Secretary of State, relative to information regarding heavy ordnance of France, was read and filed.

A letter with plans from Paulding, Kemble & Co., Cold Spring, N. Y. (L. R. No. 194), submitting ideas in gun construction, and asking consideration of the improved Parrot projectile, was read and laid aside for future action.

The Board then adjourned, to meet the 17th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, November 17, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 16th instant were then read, and the Board proceeded to the consideration of the business before it.

A letter from Mr. H. F. Mann, of Pittsburgh, Pa. (L. R. No. 196), asking whether his 8.4-inch gun is before the Board, was read, and the recorder directed to reply that it is. (Letter-book No. 187.)

A letter from Dr. W. E. Woodbridge (L. R. 198), asking that specimens for examination and test be cut from his gun, and giving reasons therefor, was read, and the recorder directed to ask Dr. Woodbridge to furnish an estimate of the cost of the work. (Letter-book No. 189.)

A letter from Mr. Hugh Reilly, of New York (L. R. No. 197), submitting models of his inventions of cartridge-bags, projectiles, and plan for rifling cannon, with letters patent in each case, and argument in favor of their adoption, was then read; and, after consideration, the following resolution was unanimously adopted:

That the Board, having carefully examined the several inventions of Mr. Hugh Reilly, is of the opinion that his projectile is not any better if so good as those already in use, and, as it is composed of several parts, it would not be effective against armor. The subject of cartridge-bags is not within the scope of its investigations. The question of rifling is one it is not called upon to decide, and could not do so without a series of experiments entirely beyond its means, and which can only be undertaken by a special board.

Mr. Reilly so informed. (Letter-book No. 185.)

The following resolution was then adopted unanimously:

Resolved, That the Board now take up for final discussion and disposition, and in the order in which set aside for future consideration, each project or invention now before it.

The proposition of Mr. J. Reese, of Pittsburgh, Pa. (L. R. Nos. 25, 26, 42, and 138), were then taken up for final consideration, and the following resolution unanimously adopted:

That Mr. Reese has not presented to this Board any drawing exhibiting a plan for a gun. He recommends for gun construction steel made

by the Basic in contradistinction to the acid process. His method, as described in a general way in his papers, consists in pouring molten Bessemer or other steel around a hammered steel core 14 inches in diameter for a 12-inch gun until the mold, giving its form, is filled. After cooling, the piece is bored. It will thus be seen that Mr. Reese's proposition is to make a cast-steel gun, which does not meet the approval of this Board.

The plans proposed by Mr. W. W. Hubbell (L. R. Nos. 41, 102, and 151) were then taken up for final consideration, and the following resolution unanimously adopted:

That Mr. Hubbell's plan of a breech fermeture, described in his letters patent and accompanying papers, is not regarded as equal to the two systems now in use. He proposes, for gun construction, cast-iron produced by some process which, in his opinion, gives it greater tensile strength, but on this point this Board has no information. His plan for a gun is so indefinite it is presumed it is only intended to show the fermeture. In fact, the Board has not before it any plan from Mr. Hubbell for a gun of suitable form and dimensions to be recommended for construction; and without further knowledge of his metal, it must be looked upon as cast-iron.

The Ferris system of gun construction, submitted by Mr. C. Dunderdale, of New York City (L. R. Nos. 28, 79, 89, and 109), was taken up for final consideration, and the following resolution was unanimously adopted:

That the Board is of the opinion that the Ferris system of gun construction does not present any special advantages or improvements, and in consequence it does not recommend it for actual test.

The plans for a gun submitted to this Board by Mr. S. B. Dean, of Boston, Mass. (L. R. Nos. 75 and 173), with his drawing and explanations, were then taken up and discussed, and the following action taken thereon:

In his letters, Mr. Dean does not propose to construct a gun, but rather recommends that one be constructed by the government, of cast steel, prepared after the Terre Noire method. It is understood that in this process the steel after being cast is annealed, which is supposed to produce a similar effect to rolling or hammering. The Terre Noire steel thus made has been found excellent for projectiles, but the Board has no knowledge of its suitableness when cast in the large masses required for guns of 50 tons and upwards. Until more is known of this metal by test the Board does not recommend it for gun construction. The Board is of the opinion that Mr. Dean's plan of breech fermeture does not present any advantages over those now in use, and therefore it is not recommended for actual test.

The Board then adjourned to meet the 18th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, November 18, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 17th instant were then read.

Mr. Robert Woodward personally presented a drawing of a segment shell for field artillery, but, on being informed by the Board that the subject was not within the scope of its investigations, withdrew.

The proposition of Col. T. T. S. Laidley, Ordnance Department (L. R.

No. 87), that a cast-iron rifled gun be tested, and the letter of Mr. Wm. Hunt, on the "construction of ordnance" (L. R. No. 174), both advocating the best cast iron as a material for gun construction, were then taken up for final consideration, and, after discussion, the following resolution was proposed:

That the Board select from the various projects before it of cast-iron guns, pure and simple, one that fairly represents the whole, and recommend a 12-inch gun for construction and trial.

The resolution was not adopted.

Noes.—Major Mendenhall, Colonel Tower, and General Getty—3.

Ayes.—Major Parker and Lieutenant-Colonel Buffington—2.

Lieutenant-Colonel Buffington and Major Parker gave the following reasons for their votes:

1st. The experiment would not be costly, and there are improved methods of casting claimed to remove certain weaknesses inseparable from cast-iron guns.

2d. Powders and projectiles have been improved to give more uniform results and less destructive effects on guns.

3d. It is only by actual test of a large gun under these improved conditions that the suitability of cast iron for heavy ordnance can be known and its comparative merits with other metals and systems of gun construction determined.

4th. The trial of a cast-iron gun, pure and simple, may furnish useful information in regard to cast iron in combination with other metals.

After further discussion of this subject the Board adjourned to meet the 21st instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, November 21, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 18th instant were then read.

The discussion of the subject of cast-iron rifled guns was continued.

As requested by Mr. H. F. Mann, in his letter of the 9th instant (L. R. No. 193), the Board obtained from the Ordnance Board a copy of his letter of June 21, 1878, and the indorsement of the Ordnance Board thereon. (L. R. No. 203.)

Read and filed.

A letter from Mr. G. Leverich, of South Orange, N. J. (L. R. No. 199), asking whether the 12-inch Thompson rifle would be tested, and protesting against any changes in the present breech mechanism, was read, and the recorder directed to inform Mr. Leverich that the Board has not taken up the gun for consideration, and should it be decided to try the gun, he will be informed of the fact. (Letter-book No. 191.)

A letter from Mr. W. T. Arrick, attorney, Washington, D. C. (L. R. No. 200), submitting letters patent of the "Eureka" projectile for the consideration of the Board, was read; and, after careful consideration, the following resolution was unanimously adopted:

Though the Arrick or "Eureka" projectile has been extensively tried, still there can be no objection to its further trial in competition with other projectiles.

A letter from Capt. W. S. Starring, Ordnance Department, U. S. A. (L. R. No. 202), transmitting photographs showing end views of rupture of the Woodbridge 10-inch rifle, was read and filed.

A letter from Dr. W. E. Woodbridge (L. R. No. 201), in answer to the Board letter of the 18th instant, stating how he desires his gun cut up, and giving estimate of cost of the work, was read and filed.

Mr. A. H. Emery, of New York, then addressed the Board, explaining the drawings of systems of gun construction ordered from him.

The Board then adjourned to meet the 22d instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, November 22, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 21st instant were then read.

A letter from Mr. H. F. Mann (L. R. No. 204), requesting that he be informed if any tests of his 8.4-inch gun are to be made, was read and filed.

The plan of a breech-loading gun submitted by Mr. D. Tufts, of Pittsburg, Pa. (L. R. No. 142), was then taken up for final consideration, and the following resolution was unanimously adopted:

That the Board is of the opinion that Mr. Tuft's system of breceh mechanism possesses no advantages over, if it is equal to, those already in use, which have been thoroughly tried, and therefore does not recommend it for actual test.

The projectile presented by Mr. Clinton Roosevelt (L. R. No. 129), was then taken up for final consideration, and the following resolution unanimously adopted:

That the projectile presented by Mr. Roosevelt, intended to be fired from a smooth-bore gun, and to attain rotary motion by the action of the atmosphere on radial wings or flanges, does not present sufficient merit to warrant the Board in recommending it for actual test.

The plans of gun construction and conversion presented by Mr. R. R. Moffatt, of Brooklyn, N. Y. (L. R. No. 126), were then taken up for final consideration, and the following resolution unanimously adopted:

That the Board is of the opinion that the plan of gun construction and conversion submitted by Mr. R. R. Moffatt does not present any advantages over methods now in use, and the Board does not, therefore, recommend it for actual test.

The plans of gun construction, including that of the proposed 12-inch B. L. rifles, submitted by Capt. C. S. Smith, Ordnance Department (L. R. No. 67), and by Col. S. Crispin, Ordnance Department (L. R. No. 144), were taken up for consideration, but laid aside for future action.

The plan of a loading pan proposed by Lieut. A. H. Russell, Ordnance Department (L. R. Nos. 166 and 182), was taken up for final consideration, and the following resolution was unanimously adopted:

That the Board recommends, in the test of any piece of B. L. ordnance with a fermeture to which it can be applied, that a device of the kind proposed by Lieutenant Russell, Ordnance Department, be tried.

Mr. Norman Wiard's plans, specifications, correspondence, &c., in relation to sea-coast fortifications and heavy guns (L. R. No. 103), were taken up for consideration, but laid aside until the next meeting of the Board.

The plans of gun construction, projectile, fuze, and carriage submitted by Master S. Seabury, United States Navy (L. R. Nos. 110 and 121), were taken up for consideration, but laid aside for future action.

The plan of gun construction proposed by Mr. J. R. Haskell, of New York City (L. R. Nos. 40, 114, and 164), with the accompanying drawings and descriptions, was then taken up for final consideration, and the following resolution was unanimously adopted:

That the Board recommends that the Lyman-Haskell accelerating or multicharge gun, recently cast at Reading, Pa., be transported to Sandy Hook, and thoroughly tested under the direction of the War Department, at the expense of the United States, as proposed by Mr. Haskell in his communication of October 5, 1881.

The Board then adjourned, to meet the 23d instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, November 23, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 23d instant were then read.

Mr. Norman Wiard's plans, specifications, correspondence, &c., in relation to sea-coast fortifications and heavy guns (L. R. No. 103), were taken up, and, after careful consideration, were laid aside, to be acted upon at the next meeting of the Board.

The plans, specifications, estimates, &c.,presented by Mr. H. F. Mann (L. R. No. 205), were then taken up, and, after careful consideration, were laid aside for future action.

The Board then adjourned, to meet the 28th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, November 28, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 23d instant were then read.

Mr. Norman Wiard's plans, specifications, correspondence, &c. (L. R. No. 103), were then taken up for final consideration, and, after discussion, the following resolution was unanimously adopted:

That, as the Board does not assent to the arguments of Mr. Norman Wiard, as set forth in the various letters, papers, &c., accompanying his proposals of July 1, 1880, and March 28, 1881, referred to it through the Chief of Ordnance by the Secretary of War, in indorsements on letter of Mr. Wiard of the 14th of May, 1881, to show the superiority and expediency of adopting his plans of gun conversion, it does not recommend the acceptance of the proposals.

The plans, specifications, estimates, &c., presented by Mr. H. F. Mann (L. R. No. 205) were then taken up, carefully considered and discussed, and laid aside for future action.

The Board then adjourned, to meet at Sandy Hook, N. J., the 29th instant.

SANDY HOOK, N. J.,
November 29, 1881.

The Board met, pursuant to adjournment.

Present: All the members and the recorder.

The Board then examined the various pieces of ordnance at this

place, after which it adjourned, to meet in New York City on the 30th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, November 30, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.
Present: All the members and the recorder.
The proceedings of the 28th and 29th instants were then read.
The plans, specifications, estimates, &c., presented by Mr. H. F. Mann (L. R. No. 205) were taken up and fully discussed, final action thereon being deferred.

The plan of gun construction, projectile, fuse, and carriage, submitted by Master Samuel Seabury, U. S. N. (L. R. Nos. 110 and 121), and the plans of gun construction and projectile submitted by Paulding, Kemble & Co., of Cold Spring, N. Y. (L. R. No. 194), were considered, but, without action, the Board adjourned, to meet the 1st proximo, at 11 o'clock a. m.

ARMY BUILDING,
New York City, December 1, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.
Present: All the members and the recorder.
The proceedings of the 30th ultimo were then read.
The plans of gun construction, projectile, fuze, and carriage submitted by Master Samuel Seabury, U. S. N. (L. R. Nos. 110 and 121), were taken up for final action, and the following resolution unanimously adopted:

That the gun construction for a 9-inch gun, submitted by Master Samuel Seabury, U. S. N., is objectionable in several respects, principally in the fact that a large mass of steel is required for the breech receiver, which would be difficult to make and difficult to work sufficiently, particularly in this country, to insure that homogeneity necessary for strength in that part of the construction in connection with his special fermeture; again, the breech receiver projects unsupported beyond the body of the gun, and is thus subjected to vibrations; again, the breech mechanism is similar, but not superior, to the Krupp, which this Board is not prepared to recommend. For these reasons it is not recommended for actual test. The Board is of the opinion that the particular merit or advantage claimed by Master Seabury for his projectile is only a matter which can be definitely determined by actual experiment, which the Board is not in a position to undertake. And while the results in Europe of the use of copper bands are sufficiently satisfactory, the details of the number of bands, their size, and the mode of attachment, as they effect the strength and ability to penetrate iron armor, should, in the opinion of the Board, be left to future experiment. And it is therefore recommended that this projectile be tried by the Ordnance Department, with others, when circumstances and opportunity are favorable.

The subject of gun carriages and fuzes is not within the scope of the Board's investigations.

The plans of gun construction, including that of the proposed 12-inch B. L. rifles, submitted by Col. S. Crispin, Ordnance Department (L. R. No. 144), and by Capt. C. S. Smith, Ordnance Department (L. R. No. 67), were taken up, carefully considered, and laid aside for future action.

The plans of gun construction and projectile submitted by Paulding,

Kemble & Co., of Cold Spring, N. Y. (L. R. No. 194), were taken up, carefully considered, and laid aside temporarily, to allow Mr. A. H. Emery, of New York, to present his systems of gun construction to the Board.

Paulding, Kemble & Co.'s plans were then further discussed, and the following resolution unanimously adopted:

That Messrs. Paulding, Kemble & Co.'s gun construction, as explained in their printed letter and accompanying drawing, No. 2, has merit in common with like combinations involving a cast-iron case jacketed and hooped with steel, but in the opinion of the Board the wrought-iron lining-tube is objectionable. The arrangement of the contiguous parts in connection with the screw-breech closure is a good one to secure strength against fracture by longitudinal strains. The characteristic feature of this gun construction, however, seems to be the casting of the iron case in two pieces, which will effect a great saving, provided it prove efficient in strength. If any guns are made after this general system of metal combination it is recommended that the case of one be cast in two pieces for trial to test its strength. Their proposed method of improvement upon the system of construction presented by Colonel Crispin, Ordnance Department, exhibited in drawing No. 1, simply involves the same method of casting the case, and is therefore disposed of by the above action of the Board.

The Board then adjourned, to meet the 2d instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, December 2, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 1st instant were then read.

The plans of gun construction, including that of the 12-inch B. L. rifles, submitted by Col. S. Crispin, Ordnance Department (L. R. No. 144), and by Capt. C. S. Smith, Ordnance Department (L. R. No. 67), were taken up, carefully considered and discussed, and laid aside, to be acted upon at the next meeting of the Board.

The plans of gun construction submitted by Mr. A. H. Emery were then taken up, carefully considered, and discussed, but, without action, the Board adjourned, to meet the 5th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, December 5, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 2d instant were then read.

A letter from Mr. D. M. Mefford, of Toledo, Ohio (L. R. No. 207), stating that he would appear before the Board about December 10, was read, and the recorder directed to request Mr. Mefford to delay his visit until the 18th of January. (Letter-book 196.)

A letter from Mr. J. R. Haskell (L. R. No. 209), stating that he would forward, as soon as completed, the estimates asked for in the Board letter of the 28th ultimo, was read and filed.

A letter from the Ordnance Board to the Chief of Ordnance, referred

to this Board by that officer, together with his letter to the Ordnance Board, dated November 16, 1881 (L. R. No. 210), was read and filed.

A letter from Dr. J. H. McLean, of Saint Louis, Mo. (L. R. No. 208), again calling attention to his inventions, was read, and the recorder directed to request Dr. McLean to send his drawings and estimates to this office by the 10th of next month, that they may be examined. (Letter-book No. 197.)

The plans of gun construction, including that of the 12-inch B. L. rifles, submitted by Col. S. Crispin, Ordnance Department (L. R. No. 144), and by Capt. C. S. Smith, Ordnance Department (L. R. No. 67), were taken up for final action; and, after consideration and discussion, the following resolution unanimously adopted:

Respecting the plans of gun construction submitted by Col. S. Crispin and Capt. C. S. Smith through the Chief of Ordnance, viz:

Two cast-iron casings with steel tube and breech receiver—one having an interrupted screw fermeture, the other a round wedge fermeture;

Three cast-iron casings with steel breech receiver—two with interrupted screw, and one with round wedge fermeture; and

Four cast-iron casings with wrought-iron tube and steel breech receiver—three with interrupted screw and one with round wedge fermeture.

Those having combinations of wrought-iron—particularly coiled wrought-iron—as a lining for steel breeching and cast-iron casing are, in the Board's estimation, objectionable. Although the greater part of the conversions using wrought-iron as a lining tube, as detailed in the yearly reports of the Chief of Ordnance, have given in small guns apparently good and encouraging results, it is on the whole, considering the history of all the guns so converted and constructed, including the 11-inch and 12.25-inch, a questionable success. But in so expressing itself the Board desires it to be distinctly understood that it does not overlook the fact that in the small guns referred to comparatively ineffective smooth bores have been converted into effective rifles. Deeming it simply unwise to continue the use of wrought-iron tubes, particularly for B. L. conversions, and all calibers above 8 inch, until it shall have been shown that other conversions and constructions are not what from the most advanced views we have a right to expect.

Of those with steel breech receivers, with and without steel tubes, those having the round wedge fermeture require a breech receiver so massive that the necessary working of the metal, to give it the uniform strength required for such construction, is impracticable in this country at this time; it being the opinion of the Board that this system of fermeture requires, to compensate for the cutting away of so much metal, a highly wrought steel of homogeneous structure, the difficulties of producing which increase very rapidly with the size of the piece; and those with the interrupted screw fermeture, the breech receiver extending beyond the casing, lack its support, and may for that reason be defective in strength, and require, like those with the wedge fermeture, a highly wrought and large piece of steel.

Resolved, In view of the objections above set forth, that this Board does not recommend any of these constructions for trial.

Dr. W. E. Woodbridge then addressed the Board in reference to the cutting up of his gun, to obtain specimens for test, and presented the estimate of the Delamater Iron Company for doing the work required. (L. R. No. 211.)

The matter was discussed at length, and laid aside for future action.

Mr. A. H. Emery then presented the completed drawings, estimates, &c., ordered from him.

The Board then adjourned, to meet the 6th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, December 6, 1881.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 5th instant were then read.

The question of cutting up the Woodbridge gun was discussed at length, and the following resolution unanimously adopted:

As the wire-wrapped and brazed 10-inch gun, constructed by the government under the direction of Dr. Woodbridge, the proposer of the system, and subjected to test by this Board until after a total of ninety-three rounds, the last under the high pressure of 74,400 pounds per square inch, it was broken crosswise where it had revealed a weakness at the third round, showed a tenacity favorable to that system of structure, provided the manipulation could be made perfect; in view of the expense already incurred in making the gun, and its exhibited tenacity, and the desire to learn in what way the method of fabricating it has failed to produce a perfect brazing:

Resolved, That the two parts of the gun be cut up as proposed by Dr. Woodbridge, in order to reveal its interior condition, and to subject it to such tests as will furnish information needed by the Board to come to a more definite opinion as to its merits and demerits.

The following resolution was unanimously adopted:

That a committee of the Board, to consist of Col. Z. B. Tower, Lieut. Col. A. R. Buffington, Maj. F. H. Parker, Maj. J. Mendenhall, and the recorder, meet at the South Boston Iron Company's Works, Boston, Mass., Wednesday, December 14, 1881, at 11 o'clock a. m., to make an examination of the plant and material at that place, and also visit Watertown Arsenal, Mass., to examine the United States testing machine.

There being no business before the Board upon which it could act immediately, and to allow time for further information to be procured and certain preliminary steps to be taken, the Board then adjourned to meet the 18th of January, 1882, at 11 o'clock a. m.

BOSTON, MASS., *December* 14, 1881.

The committee of the Board met, pursuant to resolution.

Present: Colonel Tower, Lieutenant-Colonel Buffington, Major Parker Major Mendenhall, and the recorder.

The committee then proceeded to examine the plant and material at the South Boston Iron Company's works, including the steel breech-receivers intended for the four 12-inch B. L. rifles contracted for by the Ordnance Department, and the preparations made for casting and finishing those guns.

Dr. McLean then explained his system of gun construction, and his model and drawings were examined.

The committee then proceeded to Watertown Arsenal, Massachusetts, and examined the United States Testing Machine at that place, after which it adjourned to meet in New York City, on January 18, 1882, the day for the reassembling of the full Board.

ARMY BUILDING,
New York City, January 18, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of December 6 were then read.

The Board then proceeded to the consideration of the matter presented to it in its correspondence, viz:

A letter from Mr. E. Drew, of Boston, Mass. (L. R. No. 222), asking for certain information in regard to the 80-ton English gun, and whether any improvement in the metal used in casting heavy cannon which he might invent would be profitable to him.

The recorder was directed to inform Mr. Drew that the Board was convened to examine models, plans, &c., of gun construction that might be presented to it, and can give no opinions upon the matter referred to in his letter. (Letter-book No. 209.)

A letter from Mr. J. Reese, of Pittsburgh, Pa. (L. R. No. 221), asking to be informed of the action of the Board in his case.

The recorder was directed to inform Mr. Reese that the opinions of the Board can only be made known through the War Department after its report has been made to the Secretary of War for transmission to Congress. (Letter-book No. 208.)

A letter from Mr. F. M. Shields, of Coopwood, Miss. (L. R. No. 220), asking that his papers be returned (the papers referred to are L. R. No. 169, acted on at the meeting of the Board October 20, 1881—see page 45 of proceedings and Letter-book No. 176.)

The recorder was directed to return the papers as requested. (Letter-book No. 211.)

A letter of Mr. F. M. Shields, of Coopwood, Miss., referred to the Board by the Chief of Ordnance (L. R. No. 224), saying that he had heard nothing from the specifications, &c., of his "multi-gun" forwarded to the Board.

The letter was returned to the Chief of Ordnance with the remark that no project such as described in the letter has been received. (Letter-book No. 210.)

A letter from Mr. W. P. Hunt, of Boston, Mass. (L. R. No. 213), submitting estimates of the cost of the items enumerated in the Board letter of November 28, 1881, was read and filed.

A letter from Mr. D. M. Mefford, of Toledo, Ohio (L. R. No. 219), stating that he intended to have a working model of his gun made to submit with his drawings, was read—had been answered by the recorder during recess of the Board to the effect that the drawings only were desired.

The answer was approved.

Letters from the Chief of Ordnance (L. R. No. 214) authorizing the Board to have the Woodbridge gun cut up, and from Lieut. Col. T. G. Baylor, Ordnance Department (L. R. No. 218), stating that the Woodbridge gun had been shipped to the Delamater Iron Company, were read and filed.

A letter from Dr. J. H. McLean, of Saint Louis, Mo. (L. R. No. 223), transmitting model, drawings, and description of his "Hercules" gun, was read and laid aside for future action.

A letter from Knight Bros., Washington, D. C. (L. R. No. 225), asking whether Dr. McLean's model was received in time and safely, was read—had been answered in the affirmative. (Letter-book No. 207.)

The model and photographs of a spiral projectile submitted by Mr. D. L. Kennedy, of New York, were laid aside for future consideration.

The plans and specification of breech mechanism, projectile, &c., submitted by Chief Engineer George Quick, R. N., Hidcote House, Chipping Campden, England (L. R. No. 215), were laid aside for future consideration.

The agreement of Delamater & Co. to prepare specimens from the Woodbridge wire gun (L. R. No. 212), was read and laid aside for future consideration. A letter from the Chief of Ordnance (L. R. No. 216), forwarding report of the firing in the proof of 8-inch breech-loading rifle, No. 5, and the opinion of experts on the quality of the metal in the breech receiver, with records of tests of metal, &c., was read, and the matter laid aside for future consideration.

Mr. H. F. Mann, of Pittsburgh, Pa., then addressed the Board in reference to his inventions, after which the Board resumed the consideration of the matter presented to it in its correspondence, viz:

A letter from the Chief of Ordnance (L. R. No. 226), transmitting plans of a 12-inch B. L. rifle on the French and Italian systems of construction, with letter of explanation, blue prints, and remarks thereon, together with a report on the steel manufacturing facilities of the country—laid aside for future consideration.

The Board then discussed generally, at some length, a plan of work, and afterwards the drawings, model, &c., of Dr. McLean's "Hercules" gun, but, without action, adjourned, to meet the 19th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, January 19, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 14th ultimo and of the 18th instant were read.

Mr. A. H. Emery, of New York, then again addressed the Board in reference to his systems of gun construction.

The model, plans, and description of the system of gun construction, and plans and descriptions of projectiles presented by Dr. J. H. McLean of Saint Louis, Mo. (L. R. No. 223), were then taken up for final action, and, after consideration and discussion, the following resolution was unanimously adopted:

That the Board regards the system of gun construction presented by Dr. J. H. McLean, of Saint Louis, Mo., as exhibited in his plans and description, as defective in the following respects: That the weight of the whole gun and its parts is objectionable; that it has a multiplicity of parts and much complex machinery; that the breech block is much larger and heavier than those successfully and extensively now in use; that the system is deficient in strength, and upon the whole is impracticable for heavy ordnance. And the Board does not recommend it therefore for actual test. A careful examination of the plans and descriptions of projectiles submitted by Dr. McLean does not show that any of them has sufficient merit to warrant a recommendation for trial.

The plans and description of breech mechanism for ordnance, and the plans of a projectile submitted by Chief Engineer George Quick, R. N., Hidcote House, Chipping Campden, England (L. R. No. 215), were taken up for consideration, and after examination and discussion laid aside for further action.

The letter from the Chief of Ordnance (L. R. No. 224), transmitting

plans and descriptions of the French and Italian systems of gun construction, with accompanying papers, was taken up for consideration, the letter and accompanving papers read, and the Board then adjourned, to meet the 20th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, January 20, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.
Present: All the members and the recorder.
The proceedings of the 19th instant were read.
A letter from the Chief of Ordnance to the Secretary of War, inclosing a communication from Mr. W. P. Hunt, president of the South Boston Iron Company, requesting assistance in his efforts to obtain government aid to construct a complete ordnance manufactory, referred to the Board by the Secretary of War for an expression of its opinion upon the subject (L. R. No. 227), was read, together with the inclosure. The matter was discussed at length and finally laid aside for future action.
The letter from the Chief of Ordnance (L. R. No. 226), transmitting plans and descriptions of the French and Italian systems of gun construction, was taken up and considered at length; but, without action, the Board adjourned, to meet the 23d instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, January 23, 1882.

The Board met, pursuant to adjournment, at 11.10 o'clock a. m.
Present: All the members and the recorder.
The proceedings of the 20th instant were read.
A letter from Paulding, Kemble & Co., proprietors of the West Point Foundry, Cold Spring, N. Y. (L. R. No. 229), to the Chief of Ordnance, submitted by him to the Secretary of War, and referred by the latter to the Board in connection with the paper of Mr. W. P. Hunt, and remarks of the Chief of Ordnance thereon (L. R. No. 227), was read.
Paulding, Kemble & Co. state that they have seen Mr. Hunt's letter; that they agree with him in his statements, and think that the method he proposes, *i. e.*, of the government extending aid to private manufactories, is the only way to establish the necessary "plant" for the manufacture of heavy guns of recent design.
A letter from Mr. Timothy Davis, of Washington, D. C., to the President of the Board (L. R. No. 228), stating as their representative that there is a perfect understanding between the managers of the South Boston Iron Company and the West Point Foundry, and that they will both appear before the Board if desired, was read.
These letters were then considered in connection with Mr. Hunt's communication and the remarks of the Chief of Ordnance and the opinion of the Board prepared. (Letter-book, pages 212–13–14–15–16.)
The letter from the Chief of Ordnance (L. R. No. 226), transmitting plans and descriptions of the French and Italian systems of gun construction, was taken up and considered at length, but, without action, the Board adjourned, to meet the 24th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, January 24, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 23d instant were read.

The Board then proceeded to the consideration of a letter from the Chief of Ordnance (L. R. No. 231), transmitting reports of the Ordnance Board on the bursting of 8-inch and 11-inch B. L. chambered rifles, with his remarks thereon, and appendices giving valuable information relative to heavy guns, the experiments and conclusions of eminent ordnance authorities, and records of the endurance of tubed cast-iron guns.

The letter and a number of the appendices were read, and the matter laid aside for further action.

The letter from the Chief of Ordnance (L. R. No. 226), transmitting plans and descriptions of the French and Italian systems of gun construction, was taken up and considered at length, but, without action, the Board adjourned, to meet the 25th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, January 25, 1882.

The Board met, pursuant to adjournment, at 11.20 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 24th instant were read.

A letter from Mr. D. M. Mefford, of Toledo, Ohio (L. R. No. 232), giving a description of his method of constructing heavy ordnance and inclosing plans, was read, and after careful examination of the plans and description the following resolution was unanimously adopted:

That the Board does not approve of the plans of gun construction submitted by Mr. D. M. Mefford, of Toledo, Ohio, and cannot, therefore, recommend a gun constructed on such a plan for actual test.

Mr. Mefford so informed, by direction of the Board. (Letter-book No. 217.)

The letter from the Chief of Ordnance (L. R. No. 226) transmitting plans and descriptions of the French and Italian systems of gun construction was taken up, considered at length, and laid aside for future action.

The plans of gun construction presented by Mr. A. H. Emery, of New York (L. R. No. 230), were then considered and discussed at length, and laid aside for further action.

The plans and description of breech mechanism for ordnance and the plans of a projectile submitted by Chief Engineer George Quick, R. N., Hidcote House, Chipping Campden, England (L. R. No. 215), were then taken up for final action, carefully considered, and the following resolution unanimously adopted:

That the breech-loading device of Chief Engineer George Quick, R. N., though of doubtful superiority to other systems now extensively used abroad, yet appears to possess sufficient merit to warrant its trial should the Ordnance Department find it convenient so to do in the construction and test of new cannon.

The Board then adjourned, to meet the 26th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, Januarg 26, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: General Getty, Colonel Tower, Major Parker, Major Mendenhall, and the recorder.

Absent: Lieutenant-Colonel Buffington; by permission of the Board.

The proceedings of the 25th instant were read and discussed.

After an extended discussion of the plans before it and of gun construction generally, the Board adjourned, to meet the 30th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, January 30, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 20th instant were read.

A letter from the Chief of Ordnance (L. R. No. 233), transmitting, for the information of the Board, certain extracts from foreign publications relative to steel-wire guns, and setting forth the advantages of using built-up guns, in contradistinction to homogeneous or simple cast guns, as a means of securing the greatest strength and least weight in gun construction, was read, together with the inclosures, and filed for reference.

A letter from Capt. J. G. Butler, Ordnance Department (L. R. No. 234), submitting drawings of three systems of gun construction, urging their trial, and giving his reasons therefor, was read, and laid aside for future consideration.

Dr. W. E. Woodbridge then read to the Board a paper (L. R. No. 235) describing in detail the method of brazing his wire gun, explaining the cause of the imperfect brazing in the ruptured gun, and the remedy for that defect in future construction. Dr. Woodbridge afterwards addressed the Board in reference to his system of construction generally.

The Board then adjourned, to meet the 31st instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, January, 31, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 30th instant were read.

Some points in regard to the tests to be made of the specimens from the Woodbridge gun were referred to and discussed with Dr. Woodbridge, after which the Board commenced the revision of the record of its proceedings.

The Board then adjourned, to meet the 1st proximo at 11 o'clock a. m.

ARMY BUILDING,
New York City, February 1, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: General Getty, Colonel Tower, Lieutenant-Colonel Buffington, Major Mendenhall, and the recorder.

Absent: Major Parker; by authority of the Board.

The proceedings of the 31st ultimo were read.

The Board concluded the revision of the record of its proceedings.

The letter of Mr. C. B. Barrows, of Brooklyn, N. Y. (L. R. No. 236), calling attention to the application of a new principle to the science of gunnery, transmitted to the Board by the Chief of Ordnance, was read, and the Board then adjourned, to meet the 3d instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, February 3, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 1st instant were read.

The consideration of Mr. C. B. Barrow's letter (L. R. No. 236) was continued, and the following resolution unanimously adopted:

That the Board regards Mr. C. B. Barrow's device for exhausting the air from guns before firing them as impracticable.

A copy of the correspondence in connection with the Board letter of October 26, 1881, asking for information in regard to the construction, &c., of Italian heavy ordnance, transmitted to the Board by the Adjutant-General of the Army (L. R. No. 238), was read and filed.

A letter from the Chief of Ordnance (L. R. No. 239), transmitting paper translated from the Revue d'Artillerie, relative to the construction and trial of the Italian 100-ton rifled gun, was read, together with the translation, and laid aside for future consideration.

The Board then discussed at length the various plans of gun construction before it. There being no further business before it upon which immediate action could be taken, the Board then adjourned, to meet the 1st of March at 11 o'clock a. m., or sooner, at the call of the President, if necessary, for the transaction of business.

ARMY BUILDING,
New York City, March 1, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 2d ultimo were read.

The Board then proceeded to the consideration of the new matter presented in correspondence, viz:

A letter from the Hon. H. L. Dawes to the Secretary of War, and referred by the latter to the Board for the information desired.

The letter was read, together with the indorsement of the President of the Board, and filed, (L. R. No. 241.)

A copy of the correspondence in connection with the Board letter of October 26, 1881, asking for information in regard to the method of constructing the most recent French cannon, including the Schultz wire gun, transmitted to the Board by the Adjutant-General of the Army (L. R. No. 240), was read and filed.

The modified proposal of Mr. Norman Wiard to the Secretary of War (L. R. No. 242), transmitted by the latter to the Board for consideration in connection with the previous proposal bearing date March 28, 1881, was read and laid aside for future action.

A letter from Mr. C. A. Hotchkiss, of Bridgeport, Conn. (L. R. No. 243), submitting drawing and description of Mr. B. B. Hotchkiss's projectile for breech-loading ordnance, was read, the plan and sample projectile examined, and the matter laid aside for future action.

A letter from the Chief of Ordnance (L. R. No. 244), transmitting certain papers and drawings, studies on guns, left at the Ordnance Office by Mr. Paulding, of Cold Spring, N. Y., was read, together with the inclosures, and laid aside for future action.

A letter from the Chief of Ordnance (L. R. No. 245), transmitting a copy of a report made by Capt. J. G. Butler on the trial, by means of gunpowder, of cast-iron cylinders, lined and unlined, was read, and filed for reference.

A letter from the Chief of Ordnance (L. R. No. 247), transmitting a copy of Col. T. T. S. Laidley's report on the trial of two cast-iron guns, one lined with wrought-iron tube, and making certain remarks thereon, was read, together with the inclosures, and filed for reference.

A letter from Capt. C. S. Smith, Ordnance Department, transmitted to the Board by the Chief of Ordnance (L. R. No. 248), giving in connection with his letter of December 30, 1881, certain information as to the method used in assembling the parts of the French cast-iron and steel guns, and also the translation of an extract from the Revue d'Artillerie giving the latest information in regard to the Italian 100-ton gun, was read, together with the inclosures, and filed for reference.

The Board then adjourned, to meet the 2d instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, March 2, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 1st instant were read.

The following letters and accompanying papers, which had been laid aside for further consideration, were then directed to be filed for reference, viz:

Letters received, Nos. 150, 216, 231, 233, and 239, from the Chief of Ordnance.

Letter received, No. 234, from Capt. J. G. Butler, Ordnance Department, was directed to be filed, as the subject had been acted upon.

The letter from the Chief of Ordnance (L. R. No. 244), transmitting certain papers, drawings, &c., for Paulding, Kemble & Co., was then taken up, the drawings carefully considered and examined, and the following resolution unanimously adopted:

That the breech-loading device presented by Paulding, Kemble & Co., shown in drawing marked "Study in Ordnance," submitted by the Chief of Ordnance with his letter dated February 6, 1882, appears to possess sufficient merit to warrant its trial, should the War Department find it proper so to do, in the construction and test of new cannon.

The modified proposal of Mr. Norman Wiard (L. R. No. 242), transmitted to the Board by the Secretary of War, was then taken up for final action, and after careful consideration and discussion the following resolution was unanimously adopted:

With regard to Mr. Norman Wiard's modifications of his proposals of the 28th of March, 1881, presented to the Board by indorsement of the

Secretary of War dated February 3, 1882, viz, dividing said proposal of March 28, 1881, into four parts, for the purpose—

1st. Of furnishing part of the powder for the tests and determining the best kind to be used for the guns referred to; the best width and depths of grooves and pitch of rifling for these guns, with original length of bores unchanged; to testing the power of these guns for penetration into iron and earth, when converted into combined rifles and smooth-bores; to apply and test the "snubbing-rope" plan for checking recoil; to take velocities of all projectiles during this part of experiments, &c.

2d. To test by rapid firing the endurance of the guns referred to above.

3d. To confine experiments "to the conversion, trial, and proof of powder for the penetration of iron targets and earth works of two 15-inch smooth-bore Rodman guns into long-bore breech-loading rifled guns," &c.

4th. The furnishing of all supplies as stated in detail.

Resolved, Inasmuch as the Board does not approve of the conversion of any of the smooth-bore guns now possessed by the government, and particularly does not approve of the system or systems proposed by Mr. Wiard, that said amended proposals be not recommended for acceptance by the War Department, and (referring to the Secretary of War's indorsement) that the Board does not consider the form of the proposals objectionable, and therefore has no modifications to suggest.

The model and photographs of Mr. D. L. Kennedy's "spiral drill-pointed projectile" (L. R. No. 127) was then taken up for final action, and the following resolution unanimously adopted:

That if at any time the Ordnance Department should be engaged in experiments to determine the penetration of different kinds of projectiles into iron, this Board recommends that Mr. Kennedy's proposed spiral projectile be also tried, but it is not deemed advisable to construct an iron target simply to test his device.

The letter of Mr. C. A. Hotchkiss (L. R. No. 243), transmitting tracing and sample of Mr. B. B. Hotchkiss' projectile for breech-loading guns, was then taken up for final action, and the following resolution unanimously adopted:

That, with regard to the Hotchkiss projectile, submitted with letter of February 6, inclosing a tracing of it, as it is known by actual test to be a good and reliable projectile for B. L. guns, resolved that it be recommended for further trial by the Ordnance Department.

The drawing of the improved Parrott projectile, submitted by Paulding, Kemble & Co. (L. R. No. 194), was then examined, and the following resolution unanimously adopted:

That the improved Parrott projectile for muzzle-loading guns is recommended for actual test in connection with other projectiles in experimental or practice firing with the 8-inch muzzle-loading rifle.

The Board then adjourned, to meet the 3d instant, at the Delamater Iron Works, at 11 o'clock a. m.

DELAMATER IRON WORKS,
New York City, March 3, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.
Present: All the members and the recorder.
The Board then examined the parts of the Woodbridge 10-inch M. L.

rifled wire gun, and afterwards proceeded to the Army Building, where the proceedings of the 2d instant were read.

The Board then adjourned, to meet the 6th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, March 6, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 3d instant were read.

Mr. A. H. Emery, of New York, presented to the Board several plans for gun conversion (L. R. No. 249), and the detailed estimate of the cost of the sections and models made after the drawings prepared by him for the Board (L. R. No. 250).

The Board discussed at length several of the plans before it, and then adjourned, to meet the 7th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, March 7, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 6th instant were read.

A letter from Mr. J. R. Haskell, of New York City (L. R. No. 251), submitting, as requested by the Board in letter of November 28, 1881, an estimate of the cost of firing the "Lyman-Haskell multi-charge gun" 100 rounds, was read, discussed, and filed for reference.

The plans of gun construction and conversion submitted by Mr. A. H. Emery, of New York (L. R. Nos. 230 and 249), were examined and discussed, the accompanying descriptions and estimates read, and the matter laid aside for future action. The estimates of the weights and cost of the several sections and models of systems of gun construction to be made after the drawings prepared for the Board by Mr. A. H. Emery (L. R. No. 250) were read, and the subject discussed at length.

The Board then adjourned, to meet the 8th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, March 8, 1882.

The Board met, pursuant to adjournment, at 1 o'clock p. m.

Present: All the members and the recorder.

The proceedings of the 7th instant were read.

Mr. J. R. Haskell, of New York City, then addressed the Board in reference to the "Lyman-Haskell multi-charge gun," and asked that the Board recommend the trial of the gun in process of manufacture at Reading, Pa.

Dr. W. E. Woodbridge then addressed the Board in reference to his wire gun.

The Board then adjourned, to meet the 9th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, March 9, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: General Getty, Colonel Tower, Major Mendenhall, and the recorder.

Absent: Lieutenant-Colonel Buffington and Major Parker; by permission of the Board.

The proceedings of the 8th instant were read.

Dr. W. E. Woodbridge addressed the Board in regard to the tests to be made of specimens taken from his wire gun.

Mr. A. H. Emery then addressed the Board at length in regard to his systems of gun construction and conversion.

Mr. W. P. Hunt, President of the South Boston Iron Company, then submitted to the Board drawings of all steel, steel and cast-iron, and steel and bronze guns, and briefly explained them, stating that he intended to submit a written description and estimate of the cost of the several constructions at an early date.

The Board then adjourned, to meet the 10th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, March 10, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: General Getty, Colonel Tower, Major Mendenhall, and the recorder.

Absent: Lieutenant-Colonel Buffington and Major Parker; by permission of the Board.

The proceedings of the 9th instant were read.

The Board discussed, generally, the matter before it, and then adjourned, to meet the 13th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, March 13, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: General Getty, Colonel Tower, Major Parker, Major Mendenhall, and the recorder.

Absent: Lieutenant-Colonel Buffington; by permission of the Board.

The proceedings of the 10th instant were read.

A telegram from Lieutenant-Colonel Buffington (L. R. No. 252), giving the reason for his absence, was read.

A letter was addressed to Col. T. T. S. Laidley, commanding Watertown Arsenal, in reference to the tests to be made of specimens taken from the Woodbridge gun. (Letter-book No. 220.)

The recorder was directed to proceed to Boston to superintend the preparation and test of the specimens at Watertown Arsenal. (Letter-book No. 223.)

The Board then adjourned, to meet the 30th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, March 30, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.
Present: All the members and the recorder.
The proceedings of the 13th instant were read.
A letter from Mr. F. M. Shields, of Coopwood, Miss. (L. R. No. 255), making inquiries for his "multi-gun," which he claims to have sent to the Board, was read, and the recorder directed to reply, giving Mr. Shields all the information possible in regard to his inventions which have been received and examined. (Letter-book No. 226.)
Mr. H. F. Mann, of Pittsburg, Pa., then addressed the Board in reference to his system of gun construction, and submitted a paper (L. R. No. 258) in continuation of and in addition to his previous communications.
Mr. Henry Durell then addressed the Board in reference to a system of gun construction, explaining generally the manner of construction by a model. After discussion, Mr. Durell withdrew, with the understanding that he could submit a definite plan to the Board at a later day if he desired.
Ordnance note No. 174, relating to the Italian 100-ton gun, received from the Chief of Ordnance (L. R. No. 257), was filed for reference.
A letter from the Chief of Ordnance (L. R. No. 256), transmitting the first chapter of Colonel Crispin's report on European heavy ordnance, with remarks thereon, was read. The reading of the report was commenced, but before conclusion the Board adjourned, to meet the 31st instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, March 31, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.
Present: All the members and the recorder.
The proceedings of the 30th instant were read.
The results of the tests made at Watertown Arsenal of specimens from the Woodbridge gun were explained to the Board.
The report is hereto appended, marked "B."
The reading of the report on heavy ordnance of England, by Col. S. Crispin, Ordnance Department, transmitted to the Board by the Chief of Ordnance (L. R. No. 256), was concluded, and the Board then adjourned, to meet the 3d proximo, at 11 o'clock a. m.

ARMY BUILDING,
New York City, April 3, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.
Present: All the members and the recorder.
The proceedings of the 31st ultimo were read.
A letter from the Chief of Ordnance (L. R. No. 260), transmitting a copy of a letter from Mr. B. B. Hotchkiss, of Paris, France, descriptive of his wire gun, was read. Mr. Hotchkiss's letter and description were read, the drawing examined, and the matter laid aside for further consideration.
A letter from Capt. C. S. Smith, forwarding to the Chief of Ordnance plans of gun construction, additional to those previously forwarded, regarding a modification of the existing plans for the 12-inch B. L. rifles

now under contract, referred by the Chief of Ordnance to the Board (L. R. No. 262), was read, the drawings examined and discussed, and the matter laid aside for further consideration.

A letter from Mr. W. P. Hunt, President of the South Boston Iron Company (L. R. No. 261), submitting a portfolio of drawings of projectiles of the kind which have been furnished to the government, with statement of their advantages over other kinds, was read, the drawings examined, and the matter laid aside for further consideration.

A letter from Mr. Hunt (L. R. No. 254), giving description, estimate of cost of construction, and proof of the all-steel, steel and cast-iron, and steel and bronze guns, of which drawings were submitted on March 9, was read, the drawings examined, and the matter laid aside for further consideration.

The Board then adjourned, to meet the 4th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, April 4, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 3d instant were read.

Mr. W. P. Hunt, President of the South Boston Iron Company, addressed the Board in reference to the drawings of projectiles submitted by him.

The Board then discussed several of the plans before it.

After some further discussion of various matters before it, the Board adjourned, to meet the 5th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, April 5, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 4th instant were read.

The drawings of systems of gun construction ordered by the Board from Mr. A. H. Emery, and the estimate of the weight and cost of the different models and sections constructed after the drawings, with a view to comparative tests in the machine and with powder (L. R. No. 250), were taken up for final action, the drawings examined, the estimates read and discussed, and the following resolution unanimously adopted:

In the opinion of this Board much valuable knowledge would be gained for ordnance constructors and for the general ends of science, as to the relative effects of impulsive and continued forces, by a series of experiments of the nature set forth in this paper; yet, in view of the great cost (over $400,000), and of the delays that would be involved in carrying them out, they cannot be undertaken by this Board. It is, however, suggested that a limited number of trials be made in this direction with such models as will best tend to elucidate the subject.

The drawings and description of the Butler projectile, submitted by Mr. W. P. Hunt, President of the South Boston Iron Company (L. R. No. 261), were then taken up for final action and the following resolution unanimously adopted:

As the Butler projectile, of which drawings and description are sub-

mitted by Mr. W. P. Hunt, is known by actual trial to be a good and reliable projectile for both muzzle and breech loading guns, it is recommended for further trial in competition with other projectiles.

The plans submitted by Mr. A. H. Emery, of New York City, for the conversion of 10-inch and 15-inch smooth-bore guns, being a part of those submitted with L. R. No. 253, were then examined and discussed, and the following resolution unanimously adopted:

This Board is of the opinion that the 15 inch and 10-inch guns on hand are needed for service as they are, and that it would be inexpedient to convert them into breech-loading rifles by any process. It cannot therefore recommend their conversion by the methods presented in Mr. Emery's plans.

The Board then adjourned, to meet the 6th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, April 6, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 5th instant were read.

The Board discussed at length the Italian system of gun construction and examined the records of trials made with guns constructed on that plan.

A letter from Dr. W. E. Woodbridge (L. R. No. 263), giving the difficulties that may be found in accurately preparing and testing composite specimens, was read and filed.

The Board then adjourned, to meet the 7th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, April 7, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: General Getty, Colonel Tower, Major Parker, Major Mendenhall, and the recorder.

Absent: Lieutenant Colonel Buffington; by permission of the Board.

The proceedings of the 6th instant were read.

The plans of gun construction submitted by Mr. A. H. Emery (L. R. No. 253), and those submitted by Mr. W. P. Hunt (L. R. No. 254), were discussed, and the Board adjourned, to meet the 10th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, April 10, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 7th instant were read.

The plans of gun construction and accompanying papers submitted by Mr. W. P. Hunt, President of the South Boston Iron Company (L. R. No. 254), those submitted by the Chief of Ordnance (L. R. No. 262), and those submitted by Mr. A. H. Emery (L. R. No. 253), were examined and discussed, and the Board then adjourned, to meet the 11th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, April 11, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.
Present: All the members and the recorder.
The proceedings of the 10th instant were read.
A letter from Lieut. C. C. Morrison, Ordnance Department (L. R. No. 264), giving a description and inclosing drawing of a 12-inch steel "ribbon" gun, was read, the drawing examined, and the matter laid aside for future action.
The plans of gun construction submitted by Mr. W. P. Hunt, President of the South Boston Iron Company (L. R. No. 254), and those submitted by the Chief of Ordnance (L. R. Nos. 226 and 262), were examined and discussed, and the Board then adjourned to meet the 12th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, April 12, 1882.

The Board met, pursuant to adjournment, at 12 o'clock m.
Present: General Getty, Colonel Tower, Lieutenant-Colonel Buffington, Major Mendenhall, and the recorder.
Absent: Major Parker.
The proceedings of the 11th instant were read.
A telegram from Major Parker (L. R. No. 265), saying he could not attend the meeting of the Board, was read.
The Board discussed generally the subject of gun construction, and then adjourned to meet the 13th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, April 13, 1882.

The Board met, pursuant to adjournment, at 11.30 o'clock a. m.
Present: All the members and the recorder.
The proceedings of the 12th instant were read.
Several plans of gun construction not yet acted upon were discussed at length.
A design for an 8-inch steel wire B. L. gun, submitted by the Chief of Ordnance by indorsement on letter of Capt. C. S. Smith, was examined, the letters read, and the matter laid aside for further consideration. The Board then adjourned to meet the 14th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, April 14, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.
Present: All the members and the recorder.
The proceedings of the 13th instant were read.
The Board discussed at length several plans of gun construction before it.
There being nothing before it upon which immediate action could be taken, and to await the submission of further plans by several inventors, the Board then adjourned to meet the 1st proximo, at 11 o'clock a. m.

ARMY BUILDING,
New York City, May 1, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 14th ultimo were read.

The letters from Lieut. C. C. Morrison, Ordnance Department, and Mr. W. P. Hunt (L. R. Nos. 268, 270, and 271), asking that they be allowed to make corrections of their drawings, were read and filed. The requests had already been granted.

A letter was read from Capt. J. G. Butler, Ordnance Department (L. R. No. 272), asking that his communication to the Board on the subject of heavy ordnance be returned, as the same matter was before the Board from another source.

The recorder was directed to file the letter, and return the former communication as requested.

A letter from Col. T. T. S. Laidley, Ordnance Department (L. R. No. 273), submitting a plan and giving a description of the mode of constructing a cast-iron gun reinforced by wrapped wire, was read and laid aside for future consideration.

A letter from Mr. W. P. Hunt, President of the South Boston Iron Company (L. R. No. 274), submitting drawings and giving a description of guns of cast iron reinforced by steel wire, of cast iron reinforced by steel hoops, and of all steel, was read and laid aside for further consideration.

A letter from the Chief of Ordnance (L. R. No. 275), giving the record of firing with the 6-inch and 10.236-inch Armstrong steel riband guns, was read, together with the inclosures, and filed for reference.

A letter from the Chief of Ordnance (L. R. No. 276), submitting plans prepared by Capt. C. S. Smith, Ordnance Department, of a 12-inch M. L. rifled mortar, and alterations of plans previously submitted, as contemplated in letter of March 30, 1882, was read, and laid aside for further consideration.

A letter from Dr. W. E. Woodbridge to the Chief of Ordnance, referred to the Board by that officer (L. R. No. 278), submitting plans of heavy ordnance, with description and remarks, was read, together with the inclosures, and laid aside for further consideration.

The Board then proceeded to the consideration of the several plans of cast-iron hooped guns, being those submitted by Mr. W. P. Hunt (Design F_2), by the Chief of Ordnance (Plan $\frac{D}{1}$), and by Dr. W. E. Woodbridge (Drawing No. 1), but, without reaching a conclusion, adjourned to meet the 2d instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, May 2, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 1st instant were read.

Mr. John J. Williamson then addressed the Board in regard to a steel and wrought-iron combination metal, the invention of Mr. Eldridge Wheeler, advocating the use of the metal in gun construction. Mr. Wheeler introduced Mr. Williamson to the Board by letter. (L. R. No. 277.)

Dr. W. E. Woodbridge then addressed the Board in reference to the plans submitted by him. (L. R. No. 278.)

The Board then examined the several plans of cast-iron guns banded, with and without tubes, and wire-wound, with and without tubes, but without action adjourned to meet the 3d instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, May 3, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 2d instant were read.

Mr. H. F. Mann addressed the Board in reference to his system of gun construction.

Dr. W. E. Woodbridge addressed the Board in reference to the tests of specimens from his gun, and submitted a drawing showing the results of some tests made at the Washington navy-yard in 1879 (L. R. No. 282), and stated what he claimed as his own inventions in the drawings of guns and projectiles submitted to the Board.

The Board then examined and discussed the several plans of cast-iron guns banded, with and without tubes, and wire-wrapped, with and without tubes, but, without action, adjourned to meet on the 4th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, May 4, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 3d instant were read.

A letter from the Chief of Ordnance (L. R. No. 280), transmitting, for the information of the Board, a revised price-list of foreign ordnance, was read and filed for reference.

A letter from Dr. W. E. Woodbridge (L. R. No. 279), proposing a change in the length of his cast-iron wire-wound gun was read and laid aside for future action.

The Board then proceeded to the examination and discussion of the plans of cast-iron guns banded, with and without tubes, and wire-wound, with and without tubes, viz: Those submitted by Mr. W. P. Hunt, President of the South Boston Iron Company, Boston, Mass. (L. R. No. 269), marked Designs D, E, F, G, H, I, F_2, I_2, M, N; those submitted by the Chief of Ordnance (L. R. Nos. 226, 262, and 276), marked $\frac{A}{1}$ $\frac{A}{2}$ $\frac{A}{3}$ $\frac{B}{1}$ $\frac{B}{2}$ $\frac{C}{1}$ $\frac{C}{2}$ $\frac{D}{1}$ $\frac{D}{2}$ $\frac{E}{1}$ $\frac{E}{2}$ $\frac{F}{1}$ $\frac{F}{2}$ $\frac{G}{1}$ H, and K; that submitted by Col. T. T. S. Laidley, Ordnance Department (L. R. No. 273), marked Figure 1, and those submitted by Dr. W. E. Woodbridge (L. R. No. 278), marked Plate I and II, and the following resolution was unanimously adopted:

The Board is of the opinion that the combined cast-iron and steel guns represented in the plans submitted by the Chief of Ordnance, with his letters of January 17 and April 29, 1882, marked M and H, and in the plan submitted by Dr. W. E. Woodbridge, with his letter of March

29, 1882, modified by letter of May 3, 1882, and marked Plate II, should be constructed and tried for the following reasons:

1st. Experience thus far gained with similar gu ns promises for the combination success within usual limits of powder pressure.

2d. They can be readily and rapidly produced in this country without incurring the delay of sending to foreign countries for large masses of forged steel.

The great weight of the foregoing guns recommended for test is, however, objectionable, and this Board would prefer such combinations of materials possessing the highest tensile strength as will produce with less weight a gun capable of giving the high velocities now sought for. But while this latter class of guns is being developed through a series of careful and costly experiments, some cheaper gun, though of less power, susceptible of rapid production, in case of need, should be determined upon so that the country may not be left entirely defenseless.

The plan of a 12-inch M. L. rifled mortar, presented by the Chief of Ordnance (L. R. No. 276), and marked Plan L, was then examined, and the following resolution unanimously adopted:

The Board recommends that a rifled mortar be constructed for experiment, of the caliber and dimensions proposed by the Ordnance Department, with such projectiles as that department may determine as best suited for the purpose. These mortars are very much needed for harbor defense, and emplacements for them have already been made ready at many important places on our sea-coast.

The Board then examined and discussed the several plans of all-steel guns, but, without action, adjourned to meet the 5th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, May 5, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 4th instant were then read:

A telegram from the Hon. Secretary of War to the President of the Board (L. R. No. 283) asking that he be informed, if possible, when the report of the Board could be expected, was read, and by direction of the Board answered to the effect that the report might be expected on or before the 25th instant. (Letter-book No. 235.)

The Board then continued the examination and discussion of the plans of steel guns, viz, those submitted by Mr. W. P. Hunt, President of the South Boston Iron Company, Boston, Mass. (L. R. Nos. 254 and 269), marked Designs A, B, J, K, L, and B_2; those submitted by Mr. A. H. Emery, of New York (L. R. Nos. 230 and 253), marked Plates 1, 2, 3, 4, and 5, and that submitted by Dr. W. E. Woodbridge (L. R. No. 278), marked Plate III, and the following resolution was unanimously adopted:

This Board is of the opinion that an all-steel gun should be tested. Several of the plans for such guns presented to the Board—notably that submitted by Mr. W. P. Hunt, with his letter of April 15, 1882, marked Design B; that submitted by Mr. A. H. Emery, with his letter of January 23, 1882, marked Plate 5; and that submitted by Dr. W. E. Woodbridge, with his letter of March 29, 1882, marked Plate III—have undoubted merit. Of these we prefer the design of Mr. Hunt, but rec-

ommend for construction and trial a 10-inch gun, after the same plan, instead of the 8-inch gun shown on the drawing. Although aware that the construction of this gun is not at this time within the facilities afforded by our own manufactories, and will therefore involve the importation of the large steel tubes that go to make up the piece, we still think the gun should be tried to test the system as compared with other systems recommended, especially the forged steel and wire guns.

The Board then examined and discussed the several plans of steel-wire guns, but, without action, adjourned to meet the 8th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, May 8, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 5th instant were read.

The Board continued the examination and discussion of the plans of steel-wire guns, but final action thereon was deferred.

A letter from Maj. S. C. Lyford, Ordnance Department (L. R. No. 281), submitting plan and giving a description of the method of constructing a 12-inch wrought-iron gun, was read.

After careful examination and lengthy discussion the following resolution was unanimously adopted in reference thereto:

It is the opinion of the Board that the plan for a wrought-iron gun presented by Maj. S. C. Lyford, Ordnance Department, may be practicable for the lower caliber guns, but that it is of doubtful use for those of larger caliber, which, it is believed, can be better made of other material, and the gun is therefore not recommended for trial.

After some discussion the Board adjourned to meet the 10th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, May 10, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 8th instant were read.

A letter from Messrs. Eastland & Bonshire, of Sharpsburg, Pa. (L. R. No. 284), calling the attention of the Board to their glass "bomb shell," and requesting its examination, was read.

The recorder was directed to inform Messrs. Eastland & Bonshire that the subject of explosive shells is not deemed within the scope of the Board's investigations, which are confined strictly to inventions and improvements in heavy ordnance and projectiles. (Letter-book No. 236.)

A letter from Mr. W. T. Arrick, of Washington, D. C. (L. R. No. 285), submitting a "blue print" of the "Eureka" projectile, and requesting its careful consideration, was read and filed.

The subject had already been acted upon. (See page 48, proceedings of the Board.)

A copy of the letters patent in the case of Mr. Eldridge Wheeler's "improvement in working cast malleable metals" (L. R. No. 286), was received and filed.

The method of working had been personally explained to the Board by Mr. John J. Williamson. (See page 69, proceedings of the Board.)

A letter from Col. S. Crispin, Ordnance Department (L. R. No. 287), calling the attention of the Board to the two inclosed drawings, embodying Captain Schultz' plan for the division of strains in the construction of heavy cannon, which he deems worthy of consideration, and also referring to the system of obturation, the device of Colonel de Bange, now in use in the French land service, was read.

The Board then continued the examination and discussion of the plans of steel-wire guns, viz: Those submitted by Dr. W. E. Woodbridge (L. R. No. 278), marked Plate IV, V, VI, and VII; that submitted by the Chief of Ordnance (L. R. No. 276); that submitted by Mr. B. B. Hotchkiss, of Paris, France, through the Chief of Ordnance (L. R. No. 260); those submitted by Mr. W. P. Hunt, President of the South Boston Iron Company, Boston, Mass. (L. R. No. 269), marked Designs O and P; that submitted by Lieut. C. C. Morrison, Ordnance Department (L. R. No. 264); and that submitted by Col. S. Crispin, Ordnance Department (L. R. No. 287). With reference to the plans submitted by Dr. W. E. Woodbridge, marked Plates V and VI, the following resolution was proposed:

The plan of gun construction presented by Dr. W. E. Woodbridge, consisting of a steel tube wire wrapped and brazed is not recommended for construction and test, because the construction of the 10-inch gun and the trials made subsequently of it do not give promise of its success in the construction of large guns.

The resolution was not adopted.

Noes—Major Mendenhall, Colonel Tower, and General Getty—3.

Ayes—Major Parker and Lieutenant-Colonel Buffington—2.

The following resolution was then proposed as a substitute and adopted:

Ayes—Major Mendenhall, Colonel Tower, and General Getty—3.

Noes—Major Parker, and Lieutenant-Colonel Buffington—2.

A gun of 10-inch caliber, after the design of Dr. W. E. Woodbridge, was recommended for construction by the Board on Heavy Rifled Ordnance, convened by General Orders No. 57, of June 28, 1872. This device involved a steel tube to be bound around by steel wire under the requisite tension, and to be united by brazing with bronze. The gun was constructed at Frankford Arsenal, and submitted to the trial of ninety-three rounds, eighty-three of which were fired under the direction of this Board. It burst into two parts, just behind the trunnions, under a powder pressure of about 80,000 pounds to the square inch, as measured by the Rodman gauge. An examination and tests, at the Watertown Arsenal, of sections cut from the broken gun revealed the fact that the brazing was imperfect. Several difficulties occurred in the construction of this piece from the lack of experience in applying the brazing system to so large a mass; and further it seems probable that undue initial strains were developed on the exterior in cooling, which assisted largely in producing the transverse rupture. Could the brazing have been moderately well effected and the interior and exterior coolings properly regulated, it is believed that the gun would have been exceptionally strong. It is a merit of this method of construction that the material is not liable to give way, causing rupture, without previous indications. The transverse crack behind the trunnions where the rupture took place, increased during the firing by increments so minute that from the sixty-fifth to the eighty-fifth round, that increase amounted to only one one-hundredth of an inch. There could, therefore, be little if

any apprehension that guns made after Dr. Woodbridge's system would burst without previous warning, though imperfectly constructed.

In view of the fact that the gun tried stood quite severe tests, notwithstanding its imperfections, and that the plant used in its construction still exists at Frankford Arsenal, it is recommended that another 10-inch gun, after the model presented by Dr. Woodbridge (Plate VI accompanying his letter of March 29, 1882), be made for further trial. It is suggested that the method of strengthening the walls of the gun as against longitudinal strains, shown on his drawing for a 12-inch gun (Plate IV), be adopted in the construction proposed.

With reference to the plan submitted by Mr. B. B. Hotchkiss, through the Chief of Ordnance, the following resolution was unanimously adopted:

The plan of a steel and wire gun designed by Mr. B. B. Hotchkiss, and presented by the Chief of Ordnance, being only of 6-inch caliber, hardly comes within the category of heavy ordnance, while the information given is very meager as to details of construction. It is submitted confidentially to the Board, which alone precludes any official consideration of and report upon its merits. It is therefore respectfully returned to the Chief of Ordnance.

In reference to the plan submitted by the Chief of Ordnance the following resolution was unanimously adopted:

Though the wire gun has had but a limited trial, it seems to promise the strength requisite for the attainment of high initial velocities. The precise combination of parts that will give the best results for steel wire guns has not as yet been arrived at. To reach the solution of the problem, it will be necessary to experiment with different gun constructions after this general method, and it is with this view that the Board recommends that the 8-inch wire gun presented by the Ordnance Department be constructed for trial.

With reference to the plan submitted by Dr. W. E. Woodbridge, marked Plate IV, the following resolution was unanimously adopted:

It is the opinion of the Board that the plan of a 12-inch gun submitted by Dr. W. E. Woodbridge, Plate IV, accompanying his letter of March 29, 1882, consisting of steel tubes and bars, strengthened by wire wrapped and soldered, presents a combination and arrangement of material and parts which gives sufficient promise of strength to warrant a trial of this system of construction. The large charge of powder and heavy shot proposed to be used places it in the front rank of high-power guns, and while there may be some doubt as to its ability to endure what is claimed for it, especially with the present arrangement of the two tubes, it is believed that a high-power gun can be made on this general plan, and it is with this view that the Board recommends that a 10-inch gun on this plan be made and submitted to actual test.

The plan of an 18-inch brazed steel wire gun, re-enforced with wire soldered, submitted by Dr. W. E. Woodbridge, marked Plate VII., was laid aside, being of too large a caliber to warrant a recommendation for its actual test, since experiments to test the efficiency of the wire system are but just commenced with guns of 6-inch, 8-inch, and 10-inch calibers.

Pending further consideration of the plans before it, the Board then adjourned, to meet the 11th instant, at 11 o'clock a. m.

ARMY BUILDING,
New York City, May 11, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 10th instant were read.

The Board continued the examination and discussion of the plans of steel-wire guns still before it.

With reference to the plan submitted by Col. S. Crispin, Ordnance Department, marked Plan I, the following resolution was adopted:

Ayes—Major Mendenhall, Major Parker, Colonel Tower, and General Getty—4.

Noes—Lieutenant-Colonel Buffington—1.

The design for a wire-wrapped B. L. steel rifle gun after the plan of Captain Schultz, French artillery, for securing a division of strains, presented for the consideration of this Board by Colonel Crispin of the Ordnance Department, having already been tried abroad with more or less success, is recommended for test in common with the other designs of wire guns heretofore recommended, with a view to determining the best combination of parts for this general system of gun construction.

Lieutenant-Colonel Buffington stated that he voted *no* for the following reasons, viz:

The line or lines of resistance in any machine should coincide as far as possible to the force or forces to be resisted, which is not the case in this gun, the longitudinal support being far removed from the center. The assembling of the rods for this support around the exterior of the gun is a clumsy and unmechanical construction that may give rise to the necessity of special carriages for its use. Any loosening of the nuts, as is shown by experience in bridge structures using similar rods and nuts, or any giving way of the threads of the nuts or rods, would prove disastrous to the gun and those around it. It is a foreign invention on which royalties may be claimed, possessing no particular advantages over wire and steel guns already recommended by this Board for construction and test. And, lastly, no details of construction and cost for this particular gun are given so that an intelligent opinion may be formed of essential points to be considered before recommendation.

In reference to the plans submitted by Mr. W. P. Hunt, marked Designs O and P, and that submitted by Lieut. C. C. Morrison, Ordnance Department, the following resolution was unanimously adopted:

The plans submitted by Mr. W. P. Hunt, president of the South Boston Iron Company, Boston, Mass., with his letter of April 15, 1882, and marked Designs O and P, and that submitted by Lieut. C. C. Morrison, Ordnance Department, with his letter of April 9, 1882, are not recommended for construction and trial.

The plans, specifications, estimates, &c., presented by Mr. H. F. Mann, of Pittsburg, Pa. (L. R., Nos. 205 and 258), were then taken up for final action, the plan for a 12-inch rifle discussed at length, and the following resolution unanimously adopted:

This gun consists of a cast-iron barrel bound around the powder chamber by steel bands. It is 30 feet in length, weighs 92,000 pounds, and is balanced on its trunnions. The breech fermeture is held to the trunnions by heavy steel straps, the whole arrangement weighing 37,000 pounds additional to the weight of the barrel, giving a total weight of 129,000 pounds. This fermeture is the characteristic feature of the gun, and is the invention of Mr. Mann. The principal objection to it is its great weight, but, further, it necessitates the turning of the barrel of the gun

on its trunnions through an arc of about 10° and back again at each discharge, requiring the expenditure of more time and force than for either the Krupp wedge or the slotted screw systems. The piece possesses no advantages over the cast-iron gun bound with steel bands and with the screw fermeture recommended by this Board for trial, unless it be that it gives greater security against transverse rupture. Trials, however, of guns of similar construction, but with the simple screw fermeture, have proved successful within moderate limits of powder pressure—all that is claimed for the design of Mr. Mann as is evidenced by his powder charge and weight of projectile. The only apparent merit of the structure consists in relieving the body of the gun from longitudinal strains, and transferring them through the attached breech by means of steel straps to the trunnions. But in view of the objections set forth above to the fermeture itself—the specialty of Mr. Mann's invention—this Board fails to see sufficient reasons for recommending the gun for construction and trial.

The plan of a projectile submitted by Mr. H. F. Mann with his letter of November 16, 1881, and marked Plate III (L. R. No. 205), was then carefully examined, and the following resolution unanimously adopted:

The particular merit claimed by Mr. Mann for his projectile is the number, position, and mode of attachment of the bands. The question how these details will affect the strength and penetrating power of the projectile can only be settled by future experiment, and it is therefore recommended that this projectile be tried by the Ordnance Department with others, when circumstances and opportunity are favorable.

The plan of a projectile submitted by Dr. W. E. Woodbridge, with his letter of March 29, 1882, marked Plate VIII (L. R. No. 278), was then examined, and the following resolution unanimously adopted:

The rifle projectile proposed by Dr. W. E. Woodbridge, shown in Plate VIII, accompanying his letter of March 29, 1882, is recommended as worthy of actual test in competition with other projectiles.

The Board then adjourned, to meet the 12th instant at 11 o'clock a. m.

ARMY BUILDING,
New York City, May 12, 1882.

The Board met, pursuant to adjournment, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 11th instant were read.

A letter from Mr. H. F. Mann, of Pittsburg, Pa. (L. R. No. 288), submitting copies of his letters patent and of his remarks before the Committee on Naval Affairs of the House of Representatives, and requesting that they be filed with his previous papers, was read, and the papers filed as requested.

The Board then discussed at length the question of the form and arrangement of its report, and to allow time for its preparation adjourned, to meet at the call of the president.

ARMY BUILDING,
New York City, May 18, 1882.

The Board met, at the call of the president, at 11 o'clock a. m.

Present: All the members and the recorder.

The proceedings of the 12th instant were read.

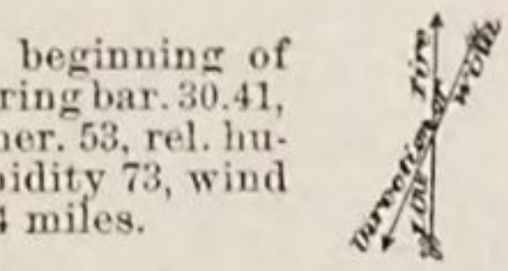
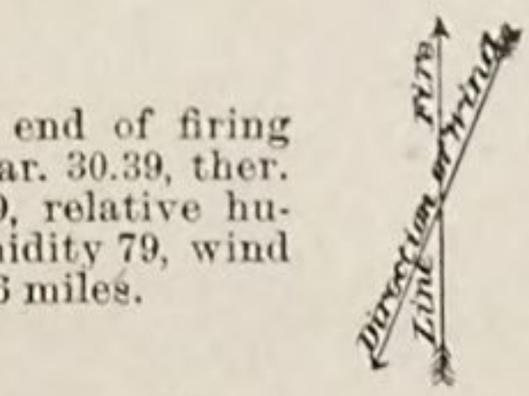
The report of the Board was then read and signed.

The proceedings of the Board were then signed, and the Board adjourned.

GEORGE W. GETTY,
Brevet Major-General and Colonel Third Artillery.
Z. B. TOWER,
Colonel of Engineers and Brevet Major-General U. S. A.
A. R. BUFFINGTON,
Lieutenant-Colonel of Ordnance.
F. H. PARKER,
Major of Ordnance.
JOHN MENDENHALL,
Major First Artillery, Brevet Colonel U. S. A.
F. E. HOBBS,
Second Lieutenant Second Artillery, Recorder.

A.—RECORD OF FIRING AND STAR-GAUGING OF THE

Record of firing with 10-*inch muzzle-loading Woodbridge*

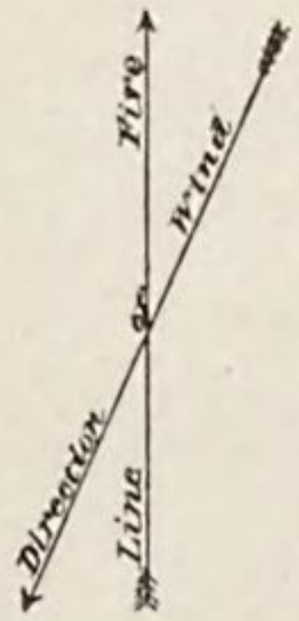
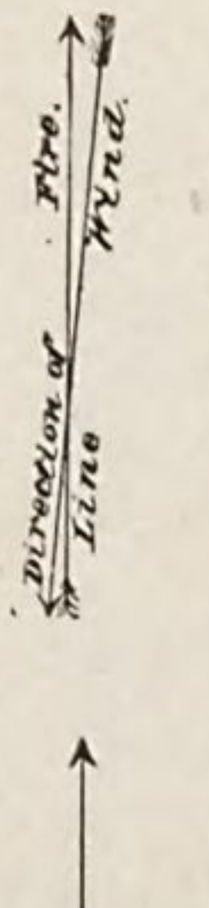
	Number of fire.	Time.	Powder.			Projectile.			Elevation in degrees	Pressure, pounds per square inch of bore.
			Kind.	Weight.		Kind.	Weight.			
				Lbs	Oz.		Lbs	Oz.		
		1881.								
	1	.....	Du Pont's hexagonal.	40	....	Butler	343	....	.....	25,000
	2	.....		40	....	....do	343	....	.....	25,000
	3	.....		50	....	....do	346	....	.....	29,000
	4	.....		50	....	....do	346	....	.....	33,000
	5	.....		60	....	....do	345	....	.....	39,000
	6	.....		60	....	....do	371	....	.....	37,500
	7	.....		60	....	....do	373	....	.....	41,500
	8	.....		70	....	....do	370	....	.....	29,500
	9	.....		70	....	....do	397	....	.....	27,000
	10	.....		70	....	....do	397	....	.....	29,000
At beginning of firing bar. 30.41, ther. 53, rel. humidity 73, wind 14 miles. 	11	Oct. 12	Du Pont's hexagonal I. O. B. No. 1. Density, 1.785; gran. 67.	60	....	Butler (new) ..	399	....	—1⅛	38,500
	12	Oct. 12		60	....	....do	399	....	— ⅝	34,500
At end of firing bar. 30.39, ther. 59, relative humidity 79, wind 16 miles. 	13	Oct. 12		60	....	....do	398	....	— ¾	34,500
	14	Oct. 12		60	....	....do	398	....	— ¾	32,500
	15	Oct. 12		60	....	....do	401	....	— ¾	35,000

WOODBRIDGE 10-INCH MUZZLE-LOADING RIFLE.

rifle, at Sandy Hook, N. J., October 12, 1881.

Instrumental velocity taken 108′ from muzzle.	Recoil, feet.	Counter recoil, ft.	Kind of pressure-gauge.	Special remarks about each fire, such as effect on piece, sound of projectile in flight, scattering of fragments, etc., etc.
Feet.				
.....	.....	.....	.....	Fired at Frankford arsenal.
.....	.....	.....	.....	
.....	.....	.....	.....	
.....	.....	.....	.....	
.....	.....	.....	.....	
.....	.....	.....	.....	
.....	.....	.....	.....	
.....	.....	.....	.....	
.....	.....	.....	.....	
.....	.....	.....	.....	
1,354	9.17	.08	Rodman	
1,327	7.08	.13	....do	Length of cartridge, 23 inches.
1,311	6.17	.15	....do	Fired into sand butt.
1,301	5.67	.17	....do	
1,303	5.67	.17	....do	After 15th round gun washed out, examined, and star-gauged.

Record of firing with 10-*inch muzzle-loading Woodbridge rifle,*

	Number of fire.	Time.	Powder.			Projectile.			Elevation in degrees.	Pressure, pounds per square inch of bore.
			Kind.	Weight.		Kind.	Weight.			
				Lbs	Oz.		Lbs	Oz.		
		1881.								
At beginning of firing, barometer, 30.255; thermometer, 62; relative humidity, 72; wind, 18 miles. 	16	Oct. 12		70	....	Butler (resaboted).	395	....	— 3/4	39,000
	17	Oct. 12		70	....	....do	395	....	— 3/4	44,500
	18	Oct. 12		70	....	....do	395	....	— 3/4	42,500
	19	Oct. 12		70	....	....do	395	....	— 3/4	38,500
	20	Oct. 12		70	....	....do	396	....	— 3/4	39,500
At end of firing, barometer, 30.265; thermometer, 61; relative humidity, 78; wind, 9 miles. 	21	Oct. 12		70	....	Butler (new)..	397	....	— 3/4	48,000
	22	Oct. 12		70	....	....do	396	....	— 3/4	39,500
	23	Oct. 12		70	....	....do	396	....	— 3/4	37,000
	24	Oct. 12		70	....	....do	397	....	— 3/4	36,500
	25	Oct. 12		70	....	....do	397	....	— 3/4	41,000
A. M.—Barometer, 30.136; thermometer, 67; relative humidity, 73; wind, 7 miles.	26	Oct. 13	Du Pont's hexagonal I. O. B. No. 1. Density, 1.785, granulation, 67.	70	....	Butler (resaboted).	397	....	—1	36,800
	27	Oct. 13		70	....	Butler (new)..	397	....	—1	Lost.
	28	Oct. 13		70	....	....do	397	....	—1	36,500
	29	Oct. 13		70	....	....do	398	....	—1	43,000
	30	Oct. 13		70	....	....do	398	....	—1	39,500
	31	Oct. 13		70	....	....do	396	....	—1	40,000
	32	Oct. 13		70	....	....do	396	....	—1	40,400
	33	Oct. 13		70	....	....do	397	....	—1	37,600
	34	Oct. 13		70	....	....do	398	....	—1	38,000
	35	Oct. 13		70	....	....do	398	....	—1	38,600

at Sandy Hook, N. J., from October 12 *to October* 13, 1881.

Length of cartridge, 26.4 inches.

Instrumental velocity, taken 108′ from muzzle.	Recoil, feet.	Counter recoil, ft.	Kind of pressure-gauge.	Special remarks about each fire, such as effect on piece, sound of projectile in flight, scattering of fragments, etc., etc.
Feet.				
1,411	5.58	0.08	Rodman	
1,430	7.67	0.08	....do	
1,424	7.67	0.08	....do	
1,408	6.13	0.08	....do	At 19th round piece of brass, driven into opening between wires to fit the gun for Centennial Exhibition, came out.
1,408	6.08	0.08	... do	
1,419	6.08	0.08	....do	
1,411	6.08	0.08	....do	
1,410	5.92	0.08	....do	
1,395	6.08	0.08	....do	
1,429	6.08	0.08	....do	After 25th round gun washed out, examined, star-gauged, and impressions taken of bore.
1,406	5.67	0.08	Woodbridge.	
1,429	5.83	0.08	....do	At 27th round rear left bolt, holding elevating post, broken; replaced.
1,389	6.00	0.08	Rodman	At 28th round rear right bolt, holding elevating post, broken; replaced.
1,433	6.15	0.08	....do	
1,404	5.50	0.08	....do	
1,415	6.00	0.08	....do	
1,423	6.00	0.08	Woodbridge.	
1,412	6.08	0.08	....do	
1,408	6.00	0.08	....do	
1,417	6.00	0.08	....do	

Fired into sand butt.

Record of firing with 10-*inch muzzle-loading Woodbridge rifle,*

	Number of fire.	Time.	Powder.			Projectile.			Elevation in degrees.	Pressure, pounds per square inch of bore.
			Kind.	Weight.		Kind.	Weight.			
				Lbs	Oz.		Lbs	Oz.		
		1881.								
P. M.—Barometer, 30.365; thermometer, 58; relative humidity, 53; wind, 6 miles.	36	Oct. 13	Du Pont's hexagonal I. O. B. No. 1. Density, 1.785; granulation, 67.	70	....	Butler (resaboted).	400	....	—1	37,000
	37	Oct. 13		70	....	....do	400	....	—1	36,000
	38	Oct. 13		70	....	....do	400	....	—1	44,000
	39	Oct. 13		70	....	....do	400	....	—1	38,000
	40	Oct. 13		70	....	....do	400	....	—1	48,000
	41	Oct. 13		70	....	....do	400	....	—1	36,800
	42	Oct. 13		70	....	....do	400	....	—1	38,500
	43	Oct. 13		70	....	....do	402	....	—1	40,400
	44	Oct. 13		70	....	Butler (new)..	401	....	—1	49,000
	45	Oct. 13		70	....	....do	402	....	—1	36,000
P. M.—Barometer, 30.28; thermometer, 62.5; relative humidity, 73; wind, 16 miles.	46	Oct. 14		70	....	....do	395	....	—1	37,500
	47	Oct. 14		70	....	....do	395	....	—1	37,600
	48	Oct. 14		70	....	....do	395	....	—1	37,500
	49	Oct. 14		70	....	....do	396	....	—1	37,200
	50	Oct. 14		70	...	....do	396	....	—1	39,000
	51	Oct. 14		70	....	....do	396	....	—1	35,200
	52	Oct. 14		70	....	....do	396	....	—1	39,500
	53	Oct. 14		70	....	....do	397	....	—1	37,000
	54	Oct. 14		70	....	... do	398	....	—1	41,500
A. M.—Barometer, 30.28; thermometer, 62.5; relative humidity, 73; wind, 16 miles.	55	Oct. 14		70	....	....do	398	....	—1	35,600

at Sandy Hook, N. J., from October 13 *to October* 14, 1881.

Instrumental velocity, taken 108′ from muzzle.	Recoil, feet.	Counter recoil, ft.	Kind of pressure-gauge.		Special remarks about each fire, such as effect on piece, sound of projectile in flight, scattering of fragments, etc., etc.
Feet.					
1,400	6.00	0.17	Rodman	Fired into sand butt. Length of cartridge, 26.4 inches.	
1,396	6.08	0.17	Woodbridge.		At 37th round pulley for hoisting shot disabled; replaced by a differential pulley.
1,417	6.00	0.17	Rodman		
1,395	6.00	0.17	Woodbridge.		
1,429	6.00	0.17	Rodman		
1,404	5.50	0.17	Woodbridge.		
1,397	5.50	0.17	Rodman		
1,433	5.50	0.17	Woodbridge.		
1,428	5.50	0.17	Rodman		
1,375	5.50	0.17	Woodbridge.		After 45th round gun washed out, examined, star-ganged, and impressions taken of bore. Half-inch bolts holding elevating post replaced by inch bolts.
1,384	6.25	0.13	Rodman		
1,412	6.75	0.17	Woodbridge.		
1,402	6.58	0.17	Rodman		
1,405	6.58	0.17	Woodbridge.		
1,404	6.67	0.17	Rodman		
1,392	6.58	0.17	Woodbridge.		
1,389	6.33	0.17	Rodman		
1,403	6.42	0.17	Woodbridge.		
1,385	6.50	0.17	Rodman		
1,393	6.33	0.17	Woodbridge.		After 55th round gun washed out and examined.

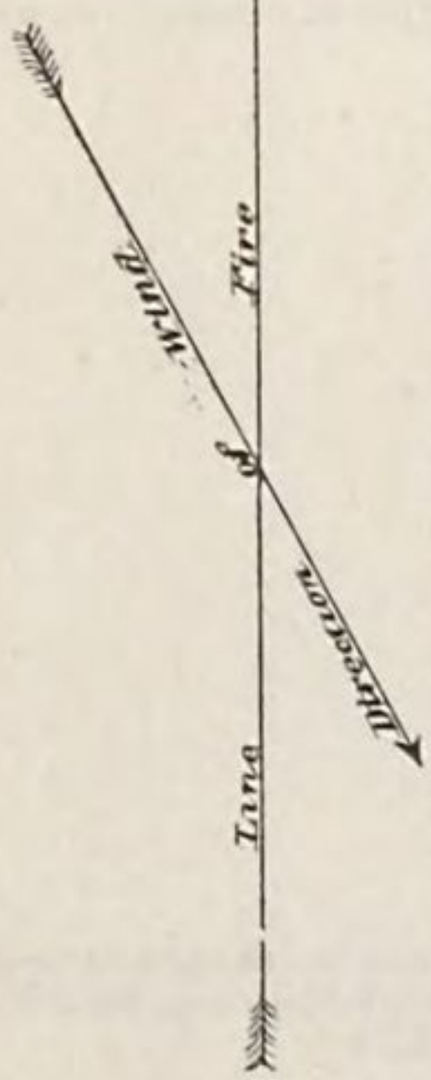
Record of firing with 10-*inch muzzle-loading Woodbridge rifle,*

	Number of fire.	Time.	Powder.			Projectile.			Elevation in degrees.	Pressure, pounds per square inch of bore.
			Kind.	Weight.		Kind.	Weight.			
				Lbs	Oz.		Lbs	Oz.		
		1881.								
	56	Oct. 14		70	....	Butler (resaboted).	394	....	—1	36,500
	57	Oct. 14		70	....	....do	395	....	—1	38,000
	58	Oct. 14		70	....	....do	396	....	—1	40,000
	59	Oct. 14		70	....	....do	397	....	—1	38,400
	60	Oct. 14		70	....	....do	399	....	—1	44,500
	61	Oct. 14		70	....	....do	399	....	—1	38,000
	62	Oct. 14		70	....	Butler (new)..	398	....	—1	40,000
	63	Oct. 14		70	....	....do	398	....	—1	38,000
	64	Oct. 14		70	....	....do	398	....	—1	41,000
	65	Oct. 14		70	....	....do	399	....	—1	37,600
	66	Oct. 15		70	....	Butler (resaboted).	395	....	—1	36,000
	67	Oct. 15		70	....	....do	396	....	—1	35,200
	68	Oct. 15		70	....	....do	397	....	—1	38,500
	69	Oct. 15		70	....	....do	397	....	—1	37,600
	70	Oct. 15		70	....	....do	397	....	—1	38,500
	71	Oct. 15		70	....	....do	397	....	—1	Lost.
	72	Oct. 15		70	....	....do	397	....	—1	40,000
	73	Oct. 15		70	....	....do	397	....	—1	37,600
	74	Oct. 15		70	....	....do	397	....	—1	40,000
	75	Oct. 15		70	....	....do	397	....	—1	38,000

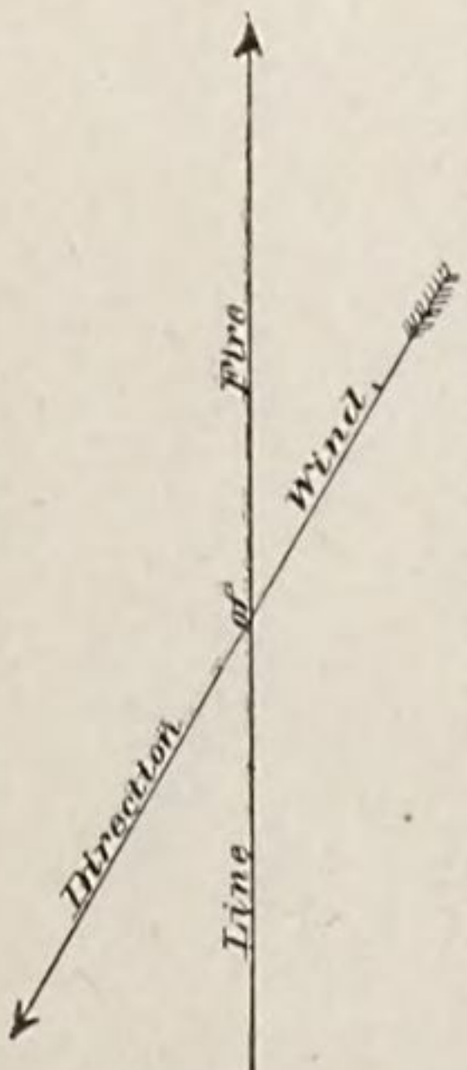
Du Pont's hexagonal I. O. B. No. 1. Density, 1.785; granulation, 67.

Du Pont's hexagonal I. O. B. No. 2. Density, 1.785; granulation, 67.

A. M.—Barometer, 30.047; thermometer, 67; relative humidity, 90; wind, 17 miles.



P. M.—Barometer, 30.408; thermometer, 52; relative humidity, 67; wind, 16 miles.

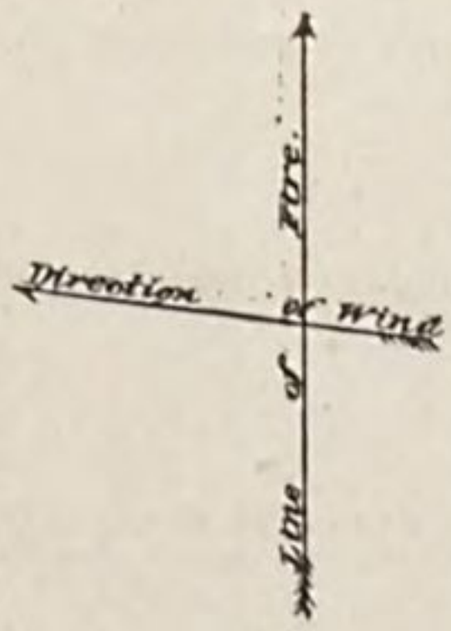
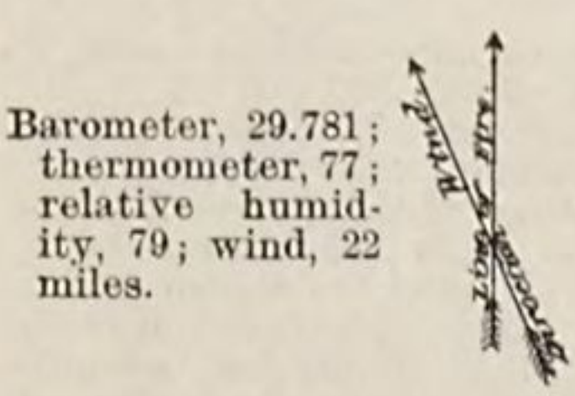


at Sandy Hook, N. J., from October 14 *to October* 15, 1881.

Fired into sand butt. Length of cartridge, 26.4 inches.

Instrumental velocity, taken 108′ from muzzle.	Recoil, feet.	Counter recoil, ft.	Kind of pressure-gauge.	Special remarks about each fire, such as effect on piece, sound of projectile in flight, scattering of fragments, etc., etc.
Fee .				
1,398	6.17	0.17	Rodman	
1,417	6.67	0.17	Woodbridge.	
1,414	6.50	0.17	Rodman	
1,409	6.50	0.17	Woodbridge.	
1,430	6.58	0.17	Rodman	
1,402	6.58	0.17	Woodbridge.	
1,399	6.33	0.17	Rodman	At 62d round piece of brass came out.
1,412	6.25	0.17	Woodbridge.	
1,412	6.42	0.17	Rodman	
1,416	6.42	0.17	Woodbridge.	After 65th round gun washed out, examined, and star-gauged. An opening, between wires, on top of gun measured and marked No. 1; width, .048 inch.
1,410	6.33	0.17	Rodman	
1,401	6.33	0.17	Woodbridge.	
1,396	6.42	0.17	Rodman	
1,402	6.50	0.17	Woodbridge.	
1,410	6.42	0.17	Rodman	
1,405	6.33	0.17	Woodbridge.	
1,398	6.33	0.17	Rodman	
1,407	6.17	0.17	Woodbridge.	
1,426	6.33	0.17	Rodman	
1,410	6.25	0.17	Woodbridge.	

Record of firing with 10-*inch muzzle-loading Woodbridge rifle,*

	Number of fire.	Time.	Powder.			Projectile.			Elevation in degrees.	Pressure, pounds per square inch of bore.
			Kind.	Weight.		Kind.	Weight.			
				Lbs	Oz.		Lbs	Oz.		
		1881.								
Barometer, 30.263; thermometer, 66; relative humidity, 68; wind, 16 miles. 	76	Oct. 15	Du Pont's hexagonal I. O. B. No. 2. Density, 1.785; granulation, 67.	70	....	Butler (resaboted.)	398	....	—1	43,500
	77	Oct. 15		70	....	....do	398	....	—1	38,000
	78	Oct. 15		70	....	....do	398	....	—1	38,500
Barometer, 30.175; thermometer, 77; relative humidity, 73; wind, 12 miles. 	79	Oct. 17		70	....	Butler (resaboted).	395	....	—1	38,000
	80	Oct. 17		70	....	....do	395	....	—1	40,000
	81	Oct. 17		70	....	....do	395	...	—1	38,500
	82	Oct. 17		70	....	....do	394	....	—1	42,500
	83	Oct. 17		70	....	....do	396	....	—1	38,000
	84	Oct. 17		70	....	....do	396	....	—1	42,000
	85	Oct. 17		70	....	....do	398	....	—1	37,600
Barometer, 29.875; thermometer, 73; relative humidity, 76; wind, 16 miles. 	86	Oct. 18	Du Pont's hexagonal I. O. A. No. 1. Density, 1.785; granulation, 67.	75	....	Butler (resaboted).	392	....	—1	42,000
	87	Oct. 18		75	....	....do	392	....	—1	38,000
	88	Oct. 18		80	....	....do	393	....	—1	48,500
	89	Oct. 18		80	..	....do	393	....	—1	44,800
	90	Oct. 18		80	....	....do	395	....	—1	47,000
Barometer, 29.781; thermometer, 77; relative humidity, 79; wind, 22 miles. 	91	Oct. 18	Du Pont's hx. I. O. A. No. 1. Dens., 1785; granulation, 67.	75	....	Butler (resaboted).	395	....	—1	52,000
	92	Oct. 18		75	....	....do	390	....	—1	57,500
	93	Oct. 18		80	....	....do	395	....	—1	74,400

at Sandy Hook, N. J., from October 15 *to October* 18, 1881.

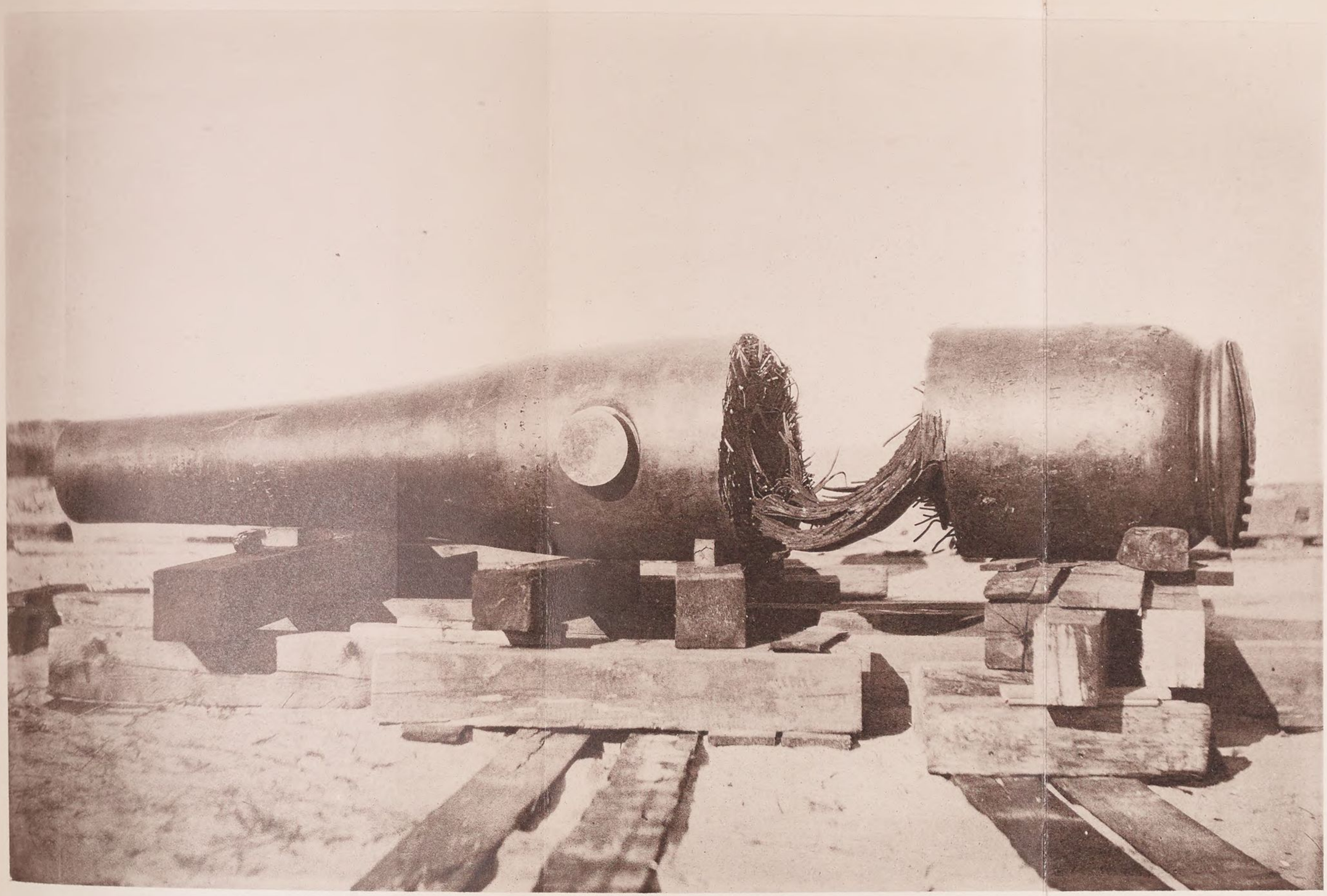
Instrumental velocity, taken 108′ from muzzle.	Recoil, feet.	Counter recoil, ft.	Kind of pressure-gauge.		Special remarks about each fire, such as effect on piece, sound of projectile in flight, scattering of fragments, etc.
Feet.					
1,418	6.25	0.17	Rodman.....	Fired into sand butt.	
1,423	6.25	0.17	Woodbridge.		
1,418	6.17	0.17	Rodman.....		At 78th round copper vent-bushing blew out and firing discontinued for the day. Replaced by a new one .05 inch larger. After 78th round gun washed out, examined, star-gauged, and impressions taken of bore.
1,425	6.42	0.17	Woodbridge.		
1,430	6.25	0.17	Rodman.....		
1,433	6.67	0.17	Woodbridge.		
1,430	6.75	0.17	Rodman.....		
1,423	6.58	0.17	Woodbridge.		
1,421	6.83	0.17	Rodman.....		
1,432	6.75	0.17	Woodbridge.		After 85th round opening No. 1 measured; also two others, and marked Nos. 2 and 3. Width of No. 1, .58″; No. 2, .012″; No. 3, .031″.
1,463	7.33	0 15	Rodman.....		Length of cartridge using 75 pounds of powder, 28.1 inches.
1,458	7.67	0.17	Woodbridge.		
1,493	7.00	0.17	Rodman....		Length of cartridge using 80 pounds of powder, 30 inches.
1,502	6.75	0.17	Woodbridge.		
1,493	6.58	0.17	Rodman.....		After round 90, gun washed out, examined, star-gauged, and impressions taken of bore. Openings in top of gun measured; also two others, and marked Nos. 4 and 5. Width of No. 1, .066″; No. 2, .018″; No. 3, .036″; No. 4, .018″; No. 5, .017″.
1,508	6.50	0.17	Woodbridge.		After 91st round, openings in top of gun measured—No. 1, .085″; No. 2, .026″; No. 3, .051″; No. 4, .030″; No. 5, .018″.
1,533	6.58	0.17	Rodman.....		At 3.07 p. m. October 18, 1881, the gun parted, under longitudinal strain, after a total of 93 rounds, 83 under the supervision of the Board, fracture being 26¾ inches from bottom of bore in the plane of openings noted and measured during the firing. Fracture very irregular, as shown in the accompanying photographs. About 40 square inches in lower left-hand quadrant held until all gas had escaped. Breech fragment struck ground 46 feet directly in rear of the trunnion beds and came to rest at 70 feet. Muzzle fragment fell to ground in front of carriage. Pressure-gauge found 32 feet to left of carriage.
1,486	None.	0.17	Woodbridge.		

Star-gauging of Woodbridge 10-inch muzzle-loading rifle.

Inches from muzzle.	Oct. 12, 1881.	Oct. 13, 1881.	Oct. 14, 1881.	Oct. 15, 1881.	Oct. 17, 1881.	Oct. 18, 1881.
	Diameter after 15 rounds.	Diameter after 25 rounds.	Diameter after 45 rounds.	Diameter after 65 rounds.	Diameter after 78 rounds.	Diameter after 90 rounds.
141	10.001	10.001	10.000	10.001	10.003	10.003
140	10.001	10.001	10.000	10.001	10.003	10.004
139	10.001	10.001	10.000	10.001	10.003	10.003
138	10.001	10.001	10.000	10.001	10.003	10.003
137	10.001	10.001	10.000	10.001	10.002	10.003
136	10.000	10.000	10.000	10.002	10.002	10.003
135	10.000	10.001	10.000	10.003	10.003	10.005
134	10.001	10.002	10.001	10.003	10.005	10.007
133	10.003	10.003	10.003	10.005	10.008	10.011
132	10.004	10.004	10.005	10.009	10.011	10.016
131	10.004	10.005	10.006	10.011	10.014	10.019
130	10.004	10.004	10.008	10.010	10.013	10.021
129	10.003	10.003	10.005	10.006	10.009	10.018
128	9.999	10.003	10.005	10.005	10.006	10.014
127	10.000	10.002	10,003	10.004	10.005	10.011
126	9.999	10.000	10.000	10.003	10.004	10.007
125	9.999	9.999	10.000	10.002	10.004	10.006
124	9.997	9.998	9.999	10.000	10.002	10.005
123	9.997	9.997	9.998	10.000	10.002	10.003
122	9.997	9.996	9.998	9.999	10.000	10.003
121	9.996	9.997	9.997	9.999	10.001	10.003
120	9 996	9.997	9.997	9.999	10.000	10.002
119	9.995	9.997	9.996	9.999	9.999	10.001
118	9.995	9.996	9.996	9.997	10.000	10.001
117	9.995	9.996	9.996	9.997	9.999	10.000
116	9.994	9.997	9.995	9.997	9.998	10.000
115	9.995	9.997	9.996	9.997	9.998	9.999
114	9.995	9.996	9.996	9.997	9.998	9.999
113	9.995	9.996	9.996	9.997	9.998	9.999
112	9.995	9.995	9.996	9.996	9.996	10.000
111	9.995	9.995	9.995	9.996	9.996	9.999
110	9.995	9.995	9.996	9.997	9.997	9.999
109	9.995	9.995	9.995	9.996	9.996	9.998
108	9.995	9.995	9.995	9.996	9.996	9.998
107	9.995	9.995	9.995	9.995	9.995	9.998
106	9.995	9.995	9.995	9.995	9.996	9.997
105	9.995	9.995	9.995	9,995	9.997	9.997
104	9.995	9.995	9.995	9.995	9.997	9.997
103	9.995	9.995	9.995	9.995	9.997	9.997
102	9.995	9.996	9.995	9.996	9.997	9.997
101	9.995	9.996	9.995	9.996	9.997	9.997
100	9.996	9.995	9.995	9.996	9.997	9.998
99	.....	9.996	9.996	9.996	9.996	9.997
98	9.996	9.996	9.996	9.996	9.996	9.997
97	.....	9.996	9.996	9.996	9.997	9.998
96	9.996	9.996	9.996	9.996	9.997	9.998
95	.....	9.996	9.996	9.996	9.997	9.998
94	9.997	9.996	9.996	9.996	9.996	9.998
93	.....	9.997	9.996	9.996	9.997	9.998
92	9.997	9.997	9.996	9.997	9.997	9.998
91	.....	9.997	9.996	9.996	9.997	9.997
90	9.997	9.997	9.996	9.996	9.997	9.997
89	.....	9.997	9.996	9.996	9.997	9.999
88	9.997	9.997	9.996	9.996	9.997	9.999
87	.....	9.997	9.996	9.996	9.997	9.999
86	9.997	9.997	9.996	9.996	9.997	9.999
85	.....	9.997	9.996	9.997	9.997	9.999
84	9.998	9.997	9.996	9.997	9.997	9.999
83	.....	9.997	9.996	9.997	9.997	9.999
82	9.997	9.997	9.996	9.997	9.997	9.999
81	.....	9.997	9.996	9.997	9.997	9.998
80	9.997	9.997	9.996	9.997	9.997	9.999
78	9.997	9.997	9.997	9.997	9.997	9.999
76	9.997	9.997	9.997	9.997	9.997	9.999
75	9.997	9.997	9.997	9.998	9.997	10.000
74	9.997	9.997	9.997	9.998	9.997	9.999
72	9.997	9.997	9.997	9.997	9.997	9.999
70	9.997	9.997	9.997	9.997	9.997	9.999
68	9.997	9.997	9.997	9.997	9.997	9.999
66	9.997	9.997	9.997	9.997	9.997	9.999
64	9.997	9.997	9.997	9.997	9.998	9.999
62	9.997	9.997	9.997	9.997	9.997	9.999
60	9.997	9.997	9.997	9.996	9.997	9.999
58	9.997	9.997	9.997	9.996	9.997	9.999
56	9.997	9.997	9.997	9.996	9.997	9.999
54	9.997	9.998	9.997	9.996	9.997	9.999
52	9.998	9.998	9.997	9.997	9.998	10.001

Star-gauging of Woodbridge 10-inch muzzle-loading rifle—Continued.

Inches from muzzle.	Oct. 12, 1881.	Oct. 13, 1881.	Oct. 14, 1881.	Oct. 15, 1881.	Oct. 17, 1881.	Oct. 18, 1881.
	Diameter after 15 rounds.	Diameter after 25 rounds.	Diameter after 45 rounds.	Diameter after 65 rounds.	Diameter after 78 rounds.	Diameter after 90 rounds.
50	9.998	9.998	9.997	9.997	9.998	10.000
48	9.998	9.998	9.997	9.998	9.998	10.000
46	9.999	9.998	9.998	9.998	9.999	10.000
45	9.999	9.998	9.998	9.998	9.999	10.000
44	9.998	9.998	9.998	9.998	9.999	10.000
42	9.998	9.998	9.998	9.998	9.999	10.001
40	9.998	9.998	9.998	9.998	9.999	10.000
38	9.998	9.998	9.998	9.998	9.999	10.001
36	9.999	9.999	9.999	9.999	9.999	10.001
34	9.999	9.999	9.999	9.999	9.999	10.001
32	9.999	9.999	9.999	9.999	9.999	10.001
30	9.999	9.999	9.999	9.999	9.999	10.001
28	9.999	9.999	9.999	10.000	9.999	10.002
26	10.000	10.000	10.000	10.000	10.000	10.001
24	10.000	10.000	10.000	10.000	10.000	10.003
22	10.000	10.000	10.000	10.000	10.000	10.003
20	10.000	10.000	10.000	10.000	10.000	10.003
18	10.000	10.000	10.001	10.000	10.000	10.003
16	10.001	10.000	10.001	10.000	10.002	10.003
14	10.001	10.000	10.001	10.000	10.001	10.003
12	10.001	10.001	10.001	10.000	10.000	10.003
10	10.001	10.001	10.001	10.001	10.002	10.003
8	10.001	10.001	10.001	10.001	10.002	10.004
6	10.001	10.001	10.001	10.003	10.001	10.004
4	10.000	10.000	10.000	10.000	10.000	10.004
2	10.000	9.999	9.999	9.999	9.999	10.004
1	9.999	9.999	9.998	9.998	9.998	10.001
CHAMBER.						
153	10.003	10.006	10.005	10.004	10.004	10.010
152	10.006	10.008	10.008	10.009	10.010	10.010
151	10.004	10.006	10.006	10.006	10.006	10.008
150	10.004	10.006	10.004	10.004	10.005	10.007
149	10.004	10.004	10.003	10.004	10.005	10.006
148	10.003	10.004	10.003	10.003	10.004	10.005
147	10.003	10.004	10.003	10.004	10.004	10.005
146	10.002	10.004	10.002	10.004	10.004	10.004
145	10.002	10.004	10.002	10.003	10.004	10.005
144	10.002	10.003	10.002	10.003	10.003	10.005
143	10.002	10.002	10.002	10.003	10.005	10.006
142	10.001	10.001	10.002	10.002	10.005	10.004



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HEAVY ORDNANCE AND PROJECTILES.

TO ACCOMPANY "APPENDIX II" "A."



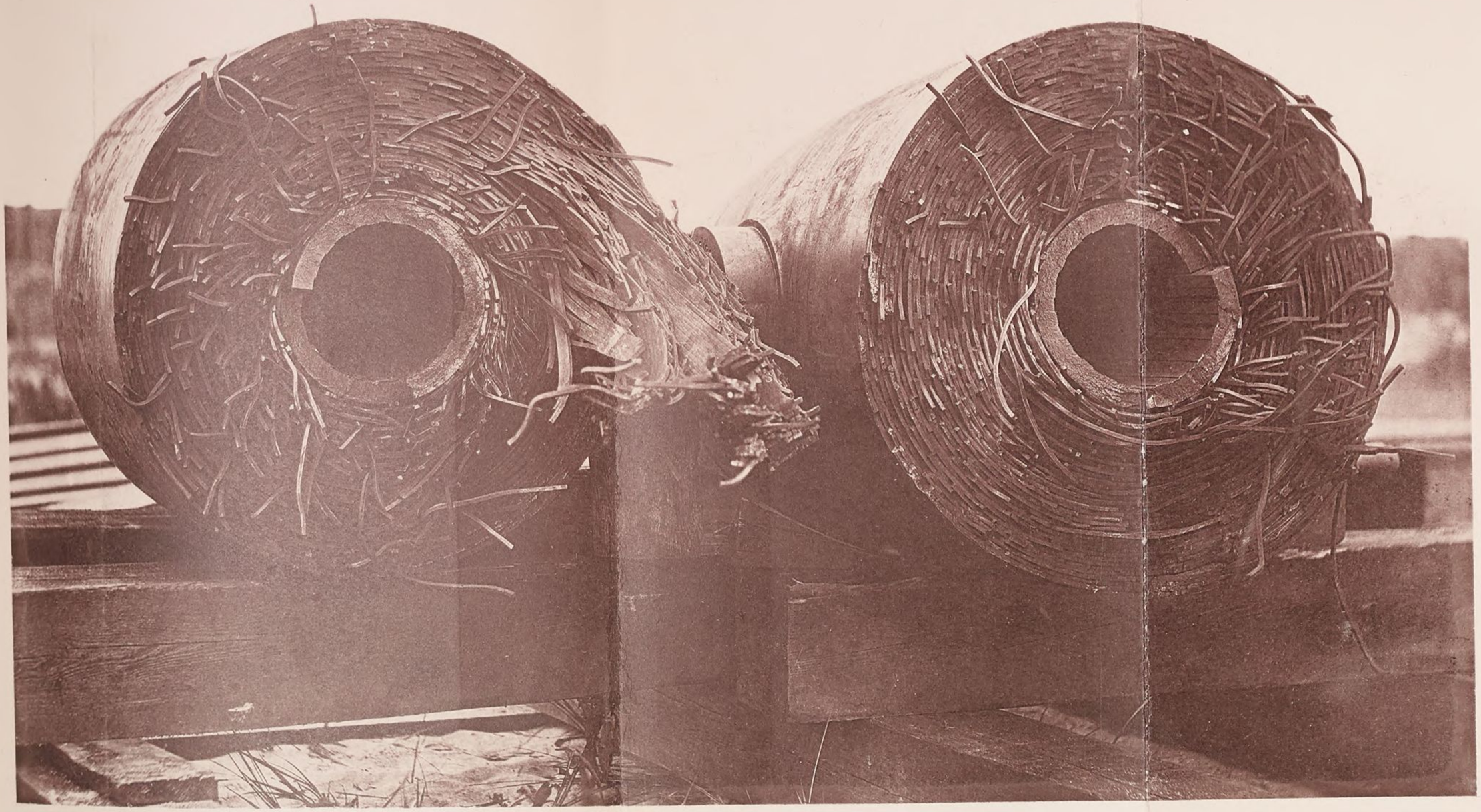
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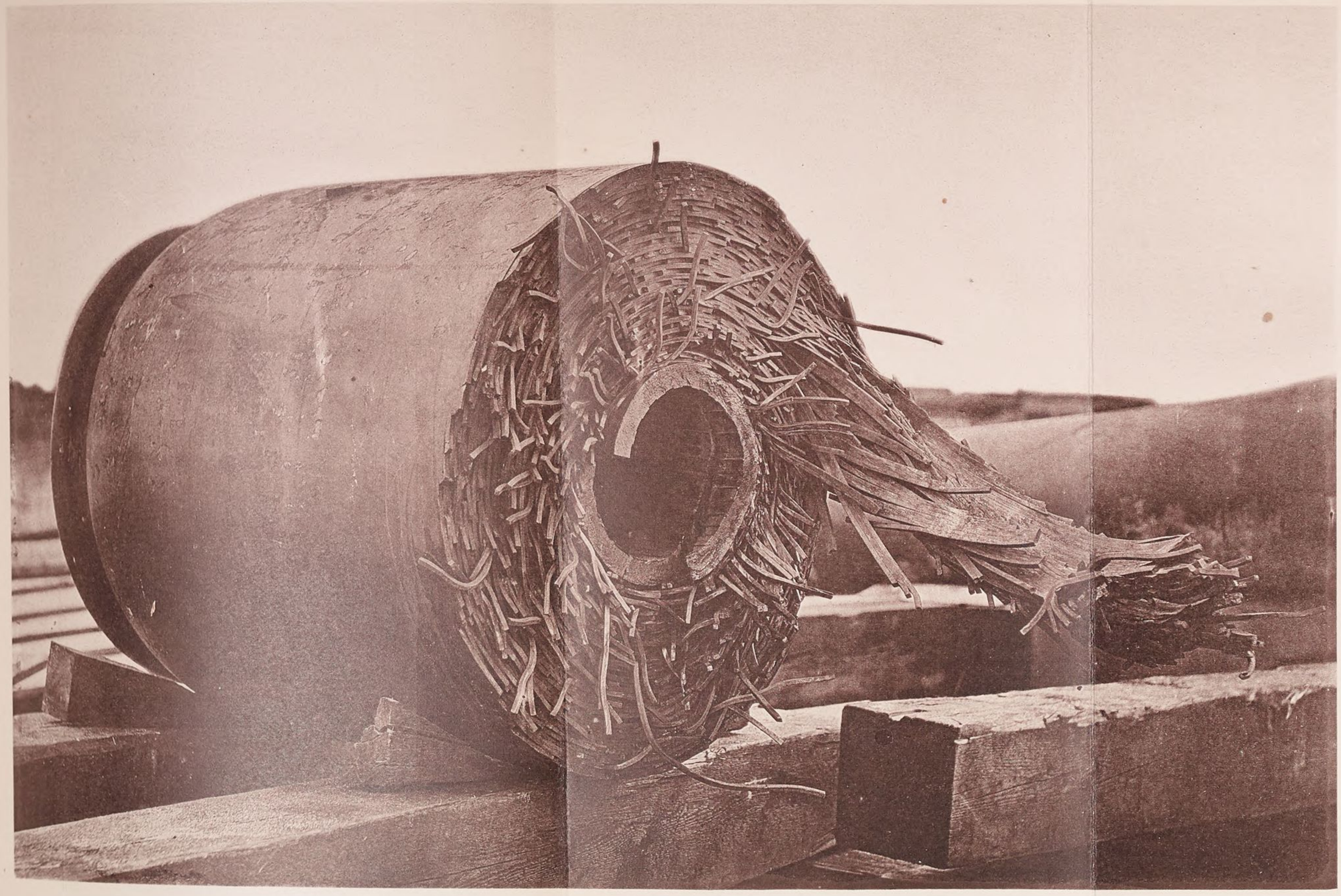
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REPORT OF THE BOARD ON

HEAVY ORDNANCE AND PROJECTILES.

TO ACCOMPANY "APPENDIX II" "A."

B.—REPORT ON THE CUTTING UP OF THE WOODBRIDGE 10-INCH M. L. RIFLED WIRE GUN AND ON THE TEST OF THE SPECIMENS TAKEN THEREFROM.

By Lieut. F. E. Hobbs, Second Artillery, Recorder.

THE CUTTING.

The Board resolved, on December 6, 1881—

That the Woodbridge gun should be cut up, as proposed by Dr. Woodbridge, to reveal its interior condition and to obtain specimens for test * * * to furnish information needed by the Board in coming to a more definite opinion as to its merits and demerits.

The Secretary of War authorized the work to be done in pursuance with this resolution, and prices for doing the work having been obtained from various capable firms, the agreement of C. H. Delamater & Co. was, on December 12, 1881, accepted, and the two pieces of the gun shipped to the works of that firm foot of West Thirteenth street, New York City. As the work was of an entirely new kind much delay was occasioned at first in making proper tools, in arranging machinery, and in the workmen familiarizing themselves with the requirements of the case; and throughout, the large amount of other work being done by the firm delayed this continually.

The muzzle piece of the gun was cut through the center of the trunnions to the bore in a plane at right angles with its axis $t\ t'$. (See accompanying drawing.) It was cut again in the same way 4 feet forward of the first cut $f\ f'$. From the piece included between these cuttings and also from the breech piece of the gun, quadrants B and C, of the whole length of these pieces, were taken, the planes of division corresponding or nearly so with radii of the bore, aa' and bb'. From these quadrants four sections, 5 inches thick, were cut transversely. The *first* having the center of its thickness opposite the bottom of the bore; the *second* in front of the first, leaving an interval of 11½ inches between them; the *third* opposite the forward part of the trunnions; and the *fourth* from the forward end of the same quadrant.

From each of these sections four pieces for specimens were taken, their lengths being in the direction of the length of the gun. Two of each four were taken from near the exterior, and two from near the lining tube. From the first and third sections, two specimens each were taken with their lengths in a radial direction. Specimens of the tube were taken from sections 2 and 3. In addition, a cutting was made cc' 4½ inches in rear of the cutting first above mentioned, giving a circular portion (or cheese) of the gun. From the forward face of this piece the portion consisting of brazed wire was turned away to a depth of one inch, leaving the steel tube projecting to that extent. The rear face was brought to a flat surface, and the steel tube turned out so as to leave a surface of junction of the tube with the interior wire six-tenths of an inch in depth, and the rifling was turned from the interior of this piece of the tube.

This was completed on March 22, 1882, in accordance with the agreement and in the manner shown in the drawing, which is herewith submitted. During the progress of the work the points of interest noted were:

1st. In cutting the first radial cut aa' through the forward piece B in the planing machine, when the tool had arrived at a line about 0.″2 from

the tube the force of tension on the wire was sufficient to break the remainder of the first layer of wire, and the brazing of the wire to the tube was started throughout the whole length of this piece. The contraction of the wire measured as accurately as possible with the instruments at hand was one thirty-second of an inch.

2d. In cutting the first radial cut *aa'* through the breech-piece C in the planing-machine, when the tool had arrived at the thirteenth layer of wire, counting from the tube, the force of tension on the wire was sufficient to start the brazing at this layer from those beyond it. The separation perceptibly extending from the forward end of the piece to a point about 6 inches in front of the bottom of the bore.

3d. During this cutting the ends of the wires where they had been cut exhibined strong magnetic properties, the magnetic force decreasing rapidly as the cutting progressed.

4th. In cutting off section No. 2 it separated into two pieces on the arc *rr'* at the thirteenth wire from the tube, on the line where fracture had been noticed (Note 2).

5th. In cutting out of section No. 2, a piece from which to take specimen No. 7 (in the slotting-machine), the cut on the line *dd'* was first made; when the cut on the line *ee'* had progressed to the point *e'* the layers of wire were torn apart under the action of the machine at *g*.

6th. When starting to make, in section No. 1, a cut on the line *hh'* to obtain specimens 17 and 18, the force of the machine tore the portion of the tube from the wire at their surface of junction.

7th. In cutting out of section No. 4 a piece from which to take specimen No. 16, the cut on the line *ii'* was first made; when the cut on the line *nn'* had progressed to *n'* the layers of wire were torn apart under the action of the machine at *k*. On the surface of this fracture a marked and well defined change in the color and character of the brazing was shown.

8th. In turning to a cylindrical form specimen No. 8, the layers of wire were torn apart at *m*.

9th. In the quadrant taken from the forward piece, the tube, as noted above, had parted from the wire in a portion of its surface of junction, and there had been some changes in form. The tangential retraction of the wire and expansion of the tube combined, being at the smaller end 0.″12, at the larger end 0.″02, and the longitudinal retraction being 0.″03. The widest opening between the wire and tube was 0.″14.

THE TESTS.

The specimens were shipped to Watertown Arsenal to be tested in the machine at that place, and arrived there March 17, 1882.

Dr. Woodbridge was informed when the testing would take place, and asked if he would come on to see the work done, and suggest any changes he might desire, or any additional experiments that might be undertaken, to give desirable information. He declined to do so, being engaged in making drawings in Washington, D. C. It only remained to carry out the series of tests that had been previously decided upon by the Board in consultation with Dr. Woodbridge, supplemented by such others as might suggest themselves during the time as liable to give desirable information.

In preparing the specimens for the machine, Colonel Laidley placed every facility at my disposal, caused the best workmen, of large experience in this particular line, to do the work, and gave special instructions that the very greatest care should be taken in the preparation and

setting of tools, and in the manipulation during the several operations, to guard against injurious strains, so that that the specimens should be as nearly perfect as possible. The testing was done by Mr. Howard, and with an amount of care and attention to all minor points that could hardly be exceeded.

The specimen A was first tested, the object being to determine the force necessary to push the ring of the tube by the wire; or otherwise to slip the wire *D* over the tube *T*. The force was applied in the same direction that the force of the exploded gunpowder would act in the gun. The results are given in the tabulated statement submitted herewith.

The tests of the longitudinal and radial strength of brazing were next undertaken, followed by the tests of the two specimens of the tube.

The pieces of wire taken from the vicinity of the plane of fracture (those loosened or pulled out by the rupture of the gun) were then tested.

The additional tests for contraction and expansion of the ring cut from the exterior of specimen A, on the lines *ss* and *ww*, came next; and, finally, the test of the tangential specimens, *x*, *x*, *x*, cut from this ring.

Careful measurements were taken of all dimensions during the progress of the work, and will be seen below.

During the progress of this part of the work the points of interest noted were:

1st. The wire itself was quite brittle. It was impossible to bend it, with the most careful manipulation, through an arc of more than 40°.

2d. In cutting through the ring taken from the outside of specimen A, it was found that the exposed ends of the wires exhibited magnetic properties, as was noticed during the cutting of the breech portion of the gun.

3d. In cutting the bronze trunnions from specimen A, evidences of steel or iron were found on the outside near the edge of the rimbases, and separated by a well-defined layer of bronze of some thickness from the wire.

TEST OF SPECIMEN A.

Area of surface of junction of tube with wire, 25,234 square inches.

Force of compression.	Remarks.
Pounds.	
193, 000	Slight snapping sound.
210, 000	Contraction of tube, 0″.01.
250, 000	Slight snap.
265, 000	Do.
284, 000	Do.
300, 000	Contraction of tube, 0″.02.
334, 000	Slight snap.
418, 000	Contraction of tube, 0″.03.
490, 000	Ultimate strength of the brazing between tube and wire.

At 490,000 pounds the tube gave way throughout its entire circumference of junction, being pressed inwards about 0″.31.

Strength per square inch, 19,418 pounds.

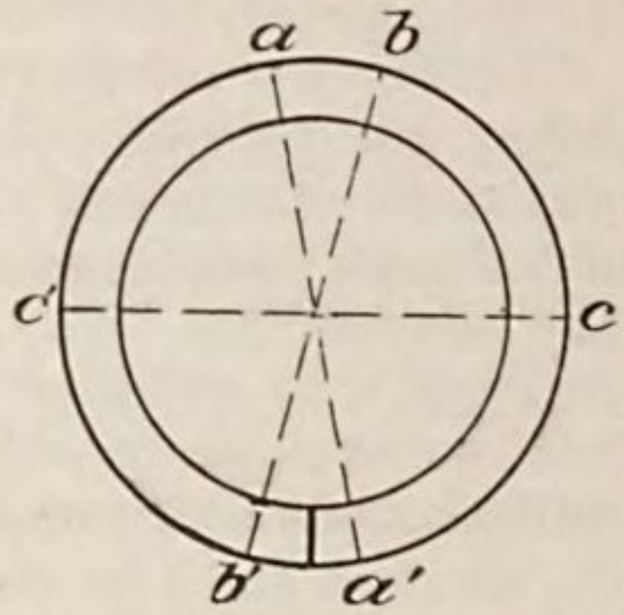
To press the tube back and out of the wire (thus determining the force of friction and compression on the tube) 37,500 pounds started the tube, 25,000 pounds force required to move the tube about 0″.15.

From this point the resistance fell off gradually to *zero* when the tube came out.

Outer diameter of tube before test, 12″.958.
Outer diameter of tube after test, 12″.960.
Diametrical expansion, 0″.002.

The piece of tube was then cut open (Fig. 1) and the diameters after the cutting found to be:

Fig. 1.

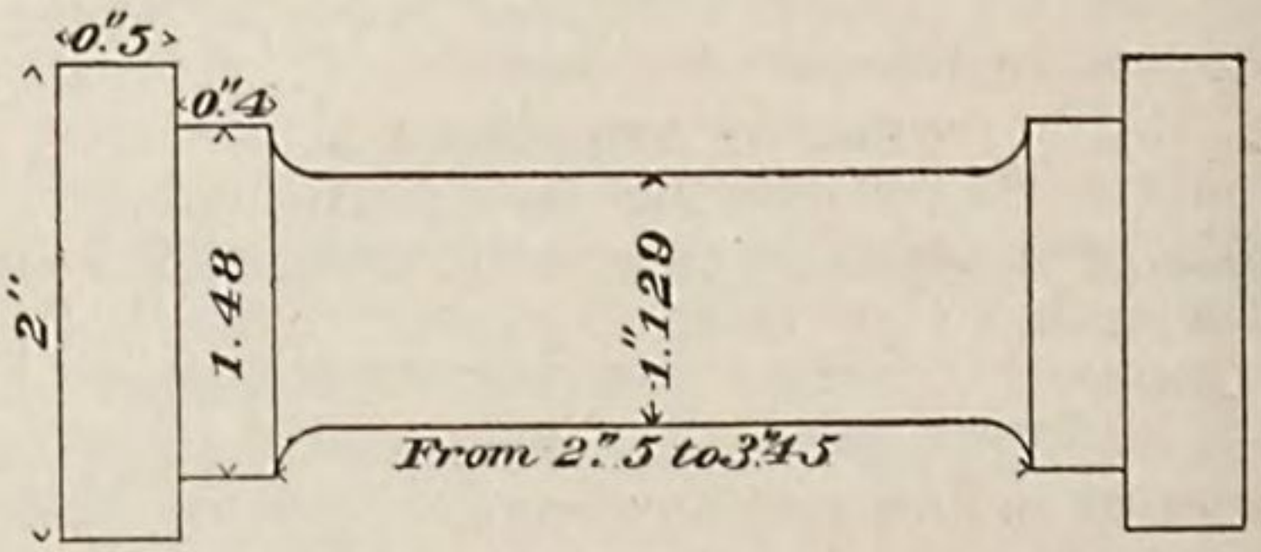


	After cut.	Before cut.	Diametrical expansion.
a, *a.'*	12″.972	12″.960	0″.012
b, *b.'*	12″.969	12″.960	0″.009
c, *c.'*	12″.963	12″.960	0″.003

TENSILE TESTS OF BRAZING.

(Specimens No. 1 to No. 20, inclusive.)

FORM OF SPECIMENS.



Specimens cut in the direction of the axis of the gun.

Number of specimen.	Tensile strength per sq. inch.	Remarks.
No. 1	6, 800	
No. 2	5, 750	Two fractures.
No. 3	16, 200	
No. 4	15, 000	
No. 5	7, 980	
No. 6	16, 850	
No. 7	.....	Lost in preparation. See report.
No. 8	.....	Do.
No. 9	37, 400	About 70 per cent. of fracture through the wire (square fracture).
No. 10	39, 350	About 50 per cent. of fracture through the wire (square fracture.)
No. 11	10, 150	
No. 12	14, 050	
No. 13	22, 400	
No. 14	34, 400	
No. 15	27, 550	
No. 16	.....	Lost in preparation. See report.

These specimens all combine shearing with tensile strength of brazing. Where fractures occur through both wire and brazing, the fractures of wire were in the direction of its length, not crosswise.

Specimens cut in the direction of radii of the gun.

Number of specimen.	Tensile strength per sq. inch.	Remarks.
No. 17	950	These fractures are square across the specimen, on the line of brazing between successive layers of the wire.
No. 18	2, 980	
No. 19	13, 500	
No. 20	8, 200	

TENSILE TESTS OF WIRES.

(Single wires taken from the loose wire at the place of rupture.)

No. 1: Size, $0''.3 \times 0''.3$; 0.09 square inch.
Specimen flattened by a pressure of 20,000 pounds per square inch in the machine before test.
Ultimate strength, 81,700 pounds per square inch; granular appearance, dull spot on one side.

No. 2: Not straightened before test.
Elastic limit, 52,200 pounds per square inch.
Ultimate strength, 84,550 pounds per square inch.
Elongation, 8.7 per cent.; granular appearance, radiated from corner slightly.

No. 3: Straightened before test as above.
Elastic limit, 52,200 pounds per square inch.
Ultimate strength, 84,200 pounds per square inch.
Elongation, 12.5 per cent.
Contraction of area, 13 per cent.
Fracture granular.

No. 4: Straightened before test as above.
Elastic limit, 45,550 pounds per square inch.
Ultimate strength, 84,110 pounds per square inch.
Elongation, 13.7 per cent.
Contraction of area, 13 per cent.
Fracture granular.

No. 5: Straightened before test as above.
Elastic limit, 48,880 pounds per square inch.
Ultimate strength, 80,330 pounds per square inch.
Elongation, 14 per cent.
Contraction of area, 20 per cent.
Fracture granular.

No. 6: Straightened before test as above.
Elastic limit, 50,000 pounds per square inch.
Ultimate strength, 66,110 pounds per square inch.
Elongation, 3 per cent.
Contraction of area, 0.
Fracture granular.

(Two wires brazed together, taken from the loose wire at the place of rupture.)

No. 7: Cross section = 0.18 square inch. Straightened before test as above.

Elastic limit, 65,550 pounds per square inch.
Ultimate strength, 95,000 pounds per square inch.
Elongation, 15 per cent.
Contraction of area, lost.
Fracture granular.

No. 8: Straightened before test as above.

Elastic limit not well defined.
Ultimate strength, 89,440 pounds per square inch.
Elongation, 11 per cent.
Contraction of area, very slight.
Fracture, granular.

All the above specimens of wire were taken from layers about half way between the bore and the exterior of the gun.

No. 9: Size, $0''.405 \times 0''.31 = 0.125+$ square inch: Straightened before test as above.

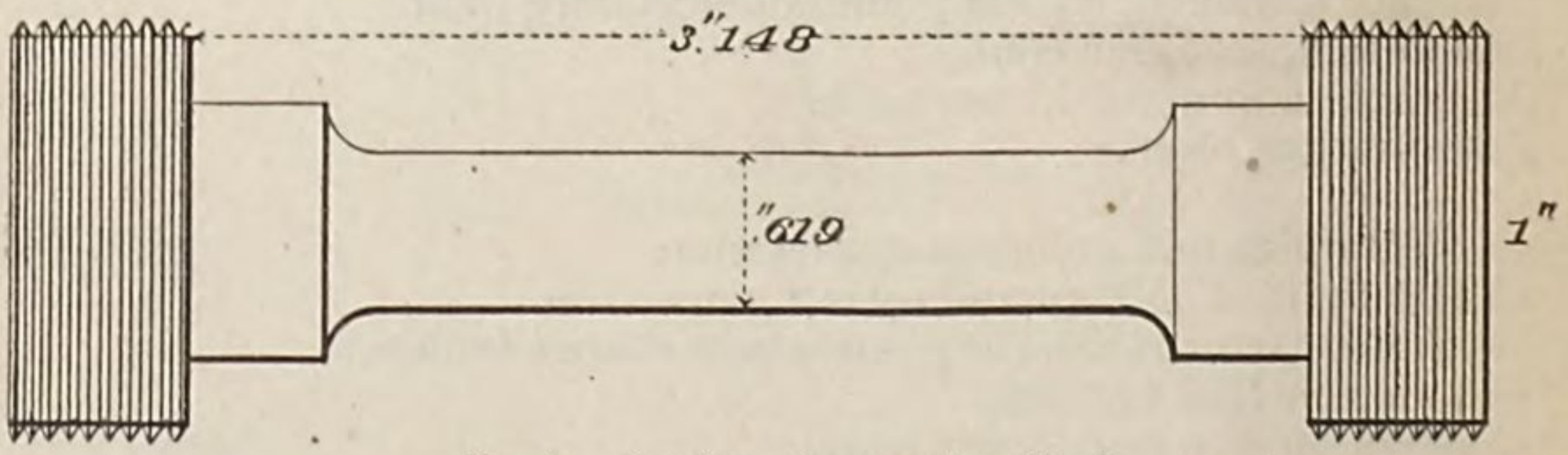
Parts of two wires:
Ultimate strength, 67,680 pounds per square inch.
Elongation, 13 per cent.
Fracture, granular; light color.

No. 10: Size $0.''272 \times 0.''276 = 0.075$ square inch; specimen dressed before test.

Ultimate strength, 68,530 pounds per square inch.
Elongation, 15.3 per cent.
Fracture, granular and dull.

Both of these specimens were taken from the outside layer of wire.

TEST OF SPECIMENS OF STEEL TUBE.



No. 1.—*Specimen from section No. 2.*

[Area of cross-section, 0.3 square inch.]

Loads.	Load per sq.inch.	Reading of gauge.	Elongation.	Set.	Remarks.	Loads.	Load per sq.inch.	Reading of gauge.	Elongation.	Set.	Remarks.
300	1,000	3.148	.....	.....		.....	1,000	3.156	.....	."008	
1,500	5,000	3.149	.001	.....		12,300	41,000	3.162	.014	.....	
3,000	10,000	3.149+	.001+	.....		12,600	42,000	3.165	.017	.....	
4,500	15,000	3.150	.002	.....		12,900	43,000	3.168	.020	.....	
6,000	20,000	3.151	.003	.....		13,200	44,000	3.172	.024	.....	
7,500	25,000	3.151+	.003+	.....		13,500	45,000	3.175	.027	.....	
9,000	30,000	3.152	.004	.....		14,400	48,000	3.186	.038	.....	
9,900	33,000	3.152+	.004+	.....		15,000	50,000	3.195	.047	.....	
10,500	35,000	3.153	.005	.....	Elastic limit about 36,000.	18,000	60,000	3.253	.105	.....	
						21,000	70,000	3.542	.394	.....	Stretching rapidly.
11,400	38,000	3.156	.008	.....							
11,700	39,000	3.158	.010	.....		21,100	70,330	.....	.....	.....	
12,000	40,000	3.160	.012	.....		0	0	3.775	.627	.....	Or 19.9 p. c.

Contraction of area, 34.7 per cent.
Fracture: granular, 40 per cent.; dull and spongy, 60 per cent.

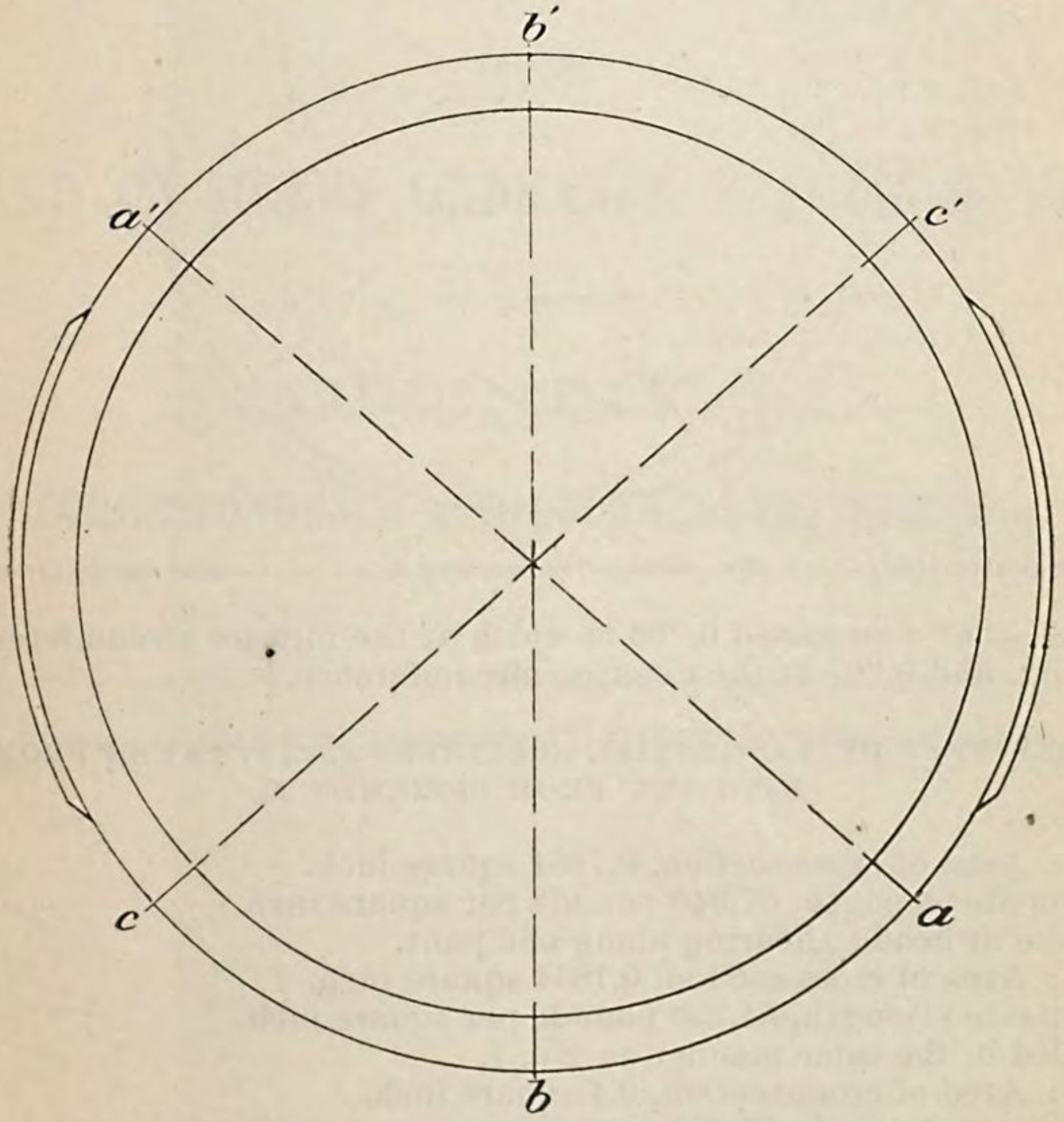
No. 2.—*Specimen from section No. 3, like No. 1.*

[Area of cross-section, 0.3 square inch. Gauge length, 2″.965. Diameter, 0″.619.]

Loads.	Load per sq.inch.	Reading of gauge.	Elongation.	Set.	Remarks.	Loads.	Load per sq.inch.	Reading of gauge.	Elongation.	Set.	Remarks.
300	1,000	2.965	.....	.....		9,900	33,000	2.983	.018	.....	
1,500	5,000	2.965+	.....	.....		10,200	34,000	2.985	.020	.....	
3,000	10,000	2.966	.001	.....		10,500	35,000	2.987+	.022+	.....	
4,500	15,000	2.966+	.001+	.....		....	1,000	2.984	.....	.″019	
6,000	20,000	2.967	.002	.....		10,800	36,800	2.991	.026	.....	
7,500	25,000	2.967+	.002+	.....	Elastic limit about 27,000	11,400	38,000	2.997	.032	.....	
						12,000	40,000	3.004	.039	.....	
9,000	30,000	2.975	.010	.....		13,500	45,000	3.023	.058	.....	
.....	1,000	2.974	.....	.″009		15,000	50,000	3.045	.080	.....	
9,300	31,000	2.978	.013	.....		18,000	60,000	3.116	.151	.....	
9,600	32,000	2.980	.015	.....		20,900	69,660	.....	.....	.....	
.....	1,000	2.977	.....	.″012		0	0	3.61	.65	.....	Or 22 p. ct.

Contraction of area, 36.7 per cent.
Fracture: granular, 50 per cent.: dull and spongy, 50 per cent.

TESTS OF RING CUT FROM EXTERIOR OF SPECIMEN A.

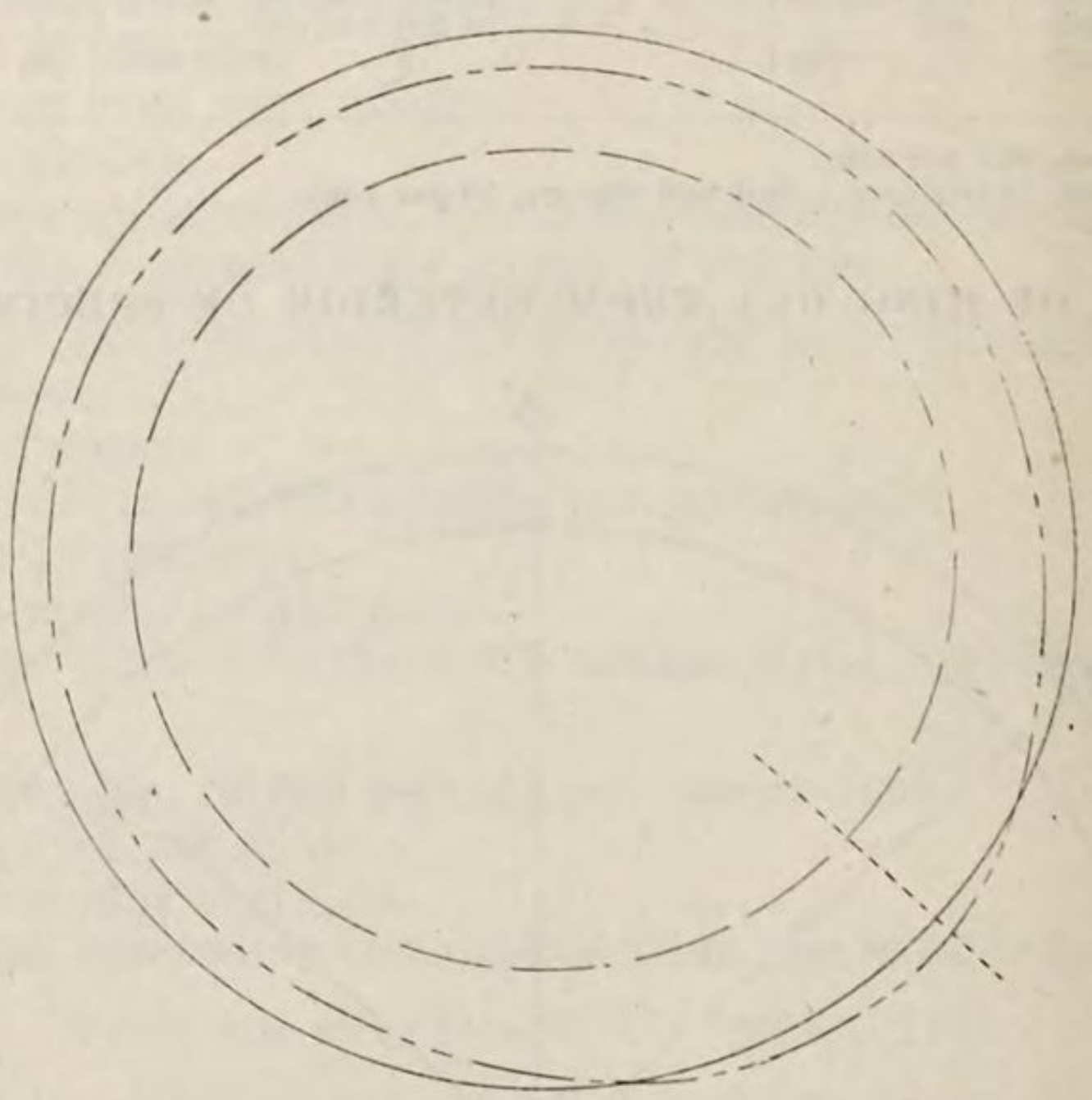


This ring was cut from the exterior of specimen A, its cross-section being 2 inches square.

The expansions and contractions were as follows:

	Contraction after being cut from specimen A.	Expansion after being cut through at *a*.
On line *a a'*	0.″0060	0.″0092
On line *b b'*	0. 0073	0. 0048
On line *c c'*	0. 0092	0. 0065

or graphically—



—— original exterior; — — — after removal from specimen A; —·· — ·· — after cutting through at *a*.

The cut at *a* increased 0.″06 in width at the interior circumference of the ring, and 0.″07 at the exterior circumference.

TENSILE TEST OF TANGENTIAL SPECIMENS *x*, *x*, *x*, TAKEN FROM THE RING CUT FROM SPECIMEN A.

No. 1: Area of cross-section, 0.7854 square inch.
Ultimate strength, 57,040 pounds per square inch.
Broke at head; shearing along one joint.
No. 2: Area of cross-section, 0.7854 square inch.
Ultimate strength, 54,750 pounds per square inch.
Failed in the same manner as No. 1.
No. 3: Area of cross-section, 0.4 square inch.
Ultimate strength, 73,000 pounds per square inch.
Contraction of area, 22 per cent.
Fracture granular and varying.
Form of specimens—the same as that of specimens Nos. 1 to 20 inclusive.

REPORT

OF THE

BOARD ON HEAVY ORDNANCE AND PROJECTILES.

APPENDIX V.*

CORRESPONDENCE AND DOCUMENTARY EXHIBITS.

*By direction of the Senate Appendixes III and IV and parts of V and VI are not printed.

CORRESPONDENCE AND DOCUMENTARY EXHIBITS.

WILLIAM T. ARRICK.

L. R., No. 285.] WASHINGTON, D. C.,
May 9, 1882.

General G. W. GETTY,
President Board on Heavy Ordnance and Projectiles, New York:

SIR: I had the honor, on the 18th of November last, of submitting to your Board a drawing and specification of the "Eureka" projectile. I had hoped to say in person what I herewith submit, but I understand your Board contemplate an early adjournment, and I fear in that event my engagements will prevent my appearing before the Board. If I should be in New York before you make your report, I shall request a short talk with you.

The "Eureka" projectile, of which I am now the sole owner and representative, has been before the country for the past seventeen years, and is, therefore, "no new thing." It has received the commendation of ordnance officers and ordnance boards from its first introduction up to the present time, and is to-day acknowledged by the Ordnance Department to have no superior. We claim it to have no equal, and it is our desire to have the privilege to demonstrate this fact, and we look to you to so recommend.

The history of this projectile being so well known to all ordnance experts, we think it a waste of your time to recapitulate it here, but you will bear with us I know while we quote a few words from the late Col. J. G. Benton, which appear from a report made in May, 1864. He says:

> The shells flew with great accuracy in all cases, taking the rifling perfectly, and in no case tumbling or wabbling. With an allowance for a uniform drift of 12 feet in 1,400 yards, nearly all the shots were sensibly line shots.

And in his report of October, 1864, he says:

> The uniform accuracy of flight of these projectiles was remarkable, exceeding anything that I have seen exhibited by either of the three standard classes of projectiles.

And concluded by saying that the action of the projectile "left nothing to be desired." Could we ask any stronger indorsement?

It was our intention to leave the matter with you without a word when we submitted the drawing and specification to you in November, but we learned a short time since that it was the purpose of your Board to devote most, if not all, of your report to the subject of gun construction, and that you looked upon the question of projectiles as a secondary one. I trust this is untrue, and that you will carefully consider the plans of projectiles laid before you, report what systems you consider "worthy of test," and recommend an exhaustive competitive trial in order to settle the question once and forever, so far as those systems now extant are concerned, of relative merit. This is all we desire, and the sooner it is done, the sooner, in my opinion, will be the solution of the gun question. I had hoped to be able to lay before you at this time

some recent reports of firing, but I am not yet in receipt of them from the bureau.

I inclose for your information a "blue print" of the 8-inch "Eureka" projectile.

Very respectfully, your obedient servant,

WM. T. ARRICK.

COL. S. CRISPIN.

L. R., No. 144.] BERNE, *July* 27, 1881.

CHIEF OF ORDNANCE,
Washington, D. C.:

SIR: I have the honor to inclose herewith, for the consideration and official action of the department, nine blue prints, illustrating so many different plans of gun construction, and each of which may be considered a modification of the general plan of construction embodied in the model adopted for the fabrication of the four 12-inch B. L. rifles ordered by Congressional enactment and now under contract, and shown in Plate No. 1. Although believing that our present plan, sustained as it is by the successful trial of the 8-inch B. L. rifle (converted) will, in the proof of higher natures, as contemplated in the tests of the 11-inch (converted) and the new 12-inch (the latter, as designed, at least the equal in power and strength of construction to any other of the civilized world of the same caliber), illustrate that we have a sound system of construction and one of comparative ease of fabrication and one of economy, yet I had thought before leaving the United States, in view of recent Congressional legislation on the subject of heavy ordnance, and the propriety of bringing to the attention of the department plans embodying the French interrupted, or slotted screw system of closing the breech, and finally through motives of securing a probable economy, that these plans should be prepared and submitted to you.

I accordingly directed Captain Smith, in general terms, to prepare these drawings, and to him, therefore, must be given the credit for the extent of the ground covered and the special arrangement of the features of the different plans.

It will be seen that all the constructions presented contemplate the production of guns of *equal power* and *strength* to the model already adopted by the bureau for the four 12-inch B. L. rifles.

The estimated cost of each plan is deduced from the contract price for the 12-inch B. L. rifle ($46,000); the work of construction being assumed as about the same in each case, and the difference in price accordingly resulting from the differences of weights of the different materials employed in the construction and in the omission in some cases of the interior wrought-iron tubing.

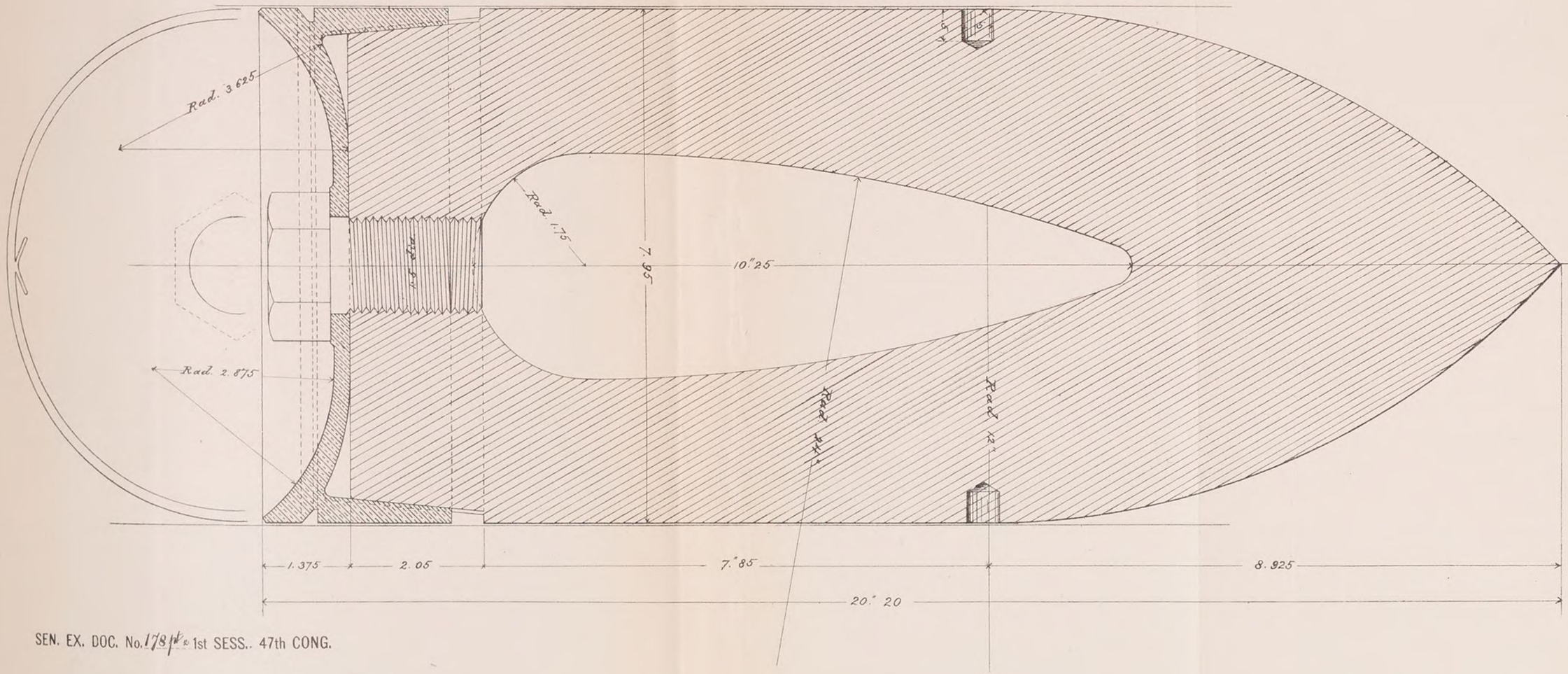
This mode of computation, also based in a measure on investigation, is believed to be sufficiently accurate for all preliminary inquiries.

The following general remarks may be here made regarding each plan.

No. 1. This construction, being the one after which the four 12-inch B. L. rifles are now being built, needs no comment, as it has been considered and approved by the department, and is identical in its broad general features with the 8-inch B. L. rifles already so successfully proved as to endurance and general well-working of the round-wedge

EUREKA CORED SHOT, 180 Lbs.

FOR 8-INCH MUZZLE-LOADING RIFLE, U.S.A.



SEN. EX. DOC. No. 178 pt 2 1st SESS., 47th CONG.

fermeture (Krupp's) adopted for closing the breech, and under test, of course, in the trial of this gun.

Its cost and general mode of construction are given in the print, as is the case in all the other constructions presented.

No. 2. This plan contemplates the employment of the slotted screw or French fermeture, and only differs in other respects from Plate I in its construction, in the use of a lighter steel breech-receiver, growing out of the using of a screw plug instead of a wedge for the breech block, and in the screw thread on the receiver being placed on the first re-enforce of the same, instead of on the second, as found in plan 1. This reduces the weight, and also the cost slightly of this plan as compared with No. 1.

No. 3. This plan is modified from No. 2 in the dimension of the steel receiver; resulting in a diminished weight of the same, and consequently is less in cost.

In this connection I may remark that I regard both plans 2 and 3 as presenting, in dimensions and general features of construction, models equally as sound and durable as plan No. 1, and each permitting the use of the French fermeture to the best advantage.

The question, therefore, in my judgment, between plan 1 and plans 2 and 3, is merely a matter as to which system, wedge or screw, will prove the best for our service; and it may be that the difference in cost may have some weight in the discussion of the question.

I, however, incline to prefer the wedge system for its simplicity of model, its fewer mechanical devices for operating the fermeture, and in consequence, in service, its less liability of need of repair or replacement of parts, and when inactive in peace requiring less attention to keep it in a practical state for war.

No. 4. This plan contemplates using the French fermeture; dispenses with the interior lining tube, and uses simply a steel breech-receiver in combination with a cast-iron body, re-enforced at the rear with a steel band.

In general features, otherwise, there is no special departure from previous plans considered. Its cost and weight, it will be seen, are, as compared with preceding ones, somewhat diminished.

No. 5 is essentially in construction the same as No. 4, save the employment of the Krupp wedge instead of the interrupted screw.

No. 6 differs in construction from Nos. 4 and 5 in the employment of exterior steel frettes or bands, increasing the weight up to 143,273 pounds in consequence, and also the price very materially.

In reference to these three last plans (4, 5, and 6) I regard plans 4 and 5 as probably good construction and comparatively cheap, but I think that No. 6 is too weighty and too costly to be recommended for trial. It is merely presented as illustrating the employment of frettes, or external rings, in our present system of construction.

No. 7 differs from No. 5 only in the addition of a short interior tube covering the dangerous spaces for pressures.

This construction will, I think, prove a good one of its kind, and is presented for the consideration of the department.

No. 8 like No. 6 is objectionable on account of weight and cost.

No. 9. This is like No. 7, using, however, the interrupted screw fermeture instead of the Krupp, and the same remarks are applicable in both cases (see No. 7).

The inclosed memoranda gives a summary of weights and costs of the different plans herein submitted; the latter based, however, as before stated, upon the contract price for the four 12-inch B. L. rifles.

As these four guns are the first to be made of this caliber, and are of

an entirely new construction, the price is naturally high, but can undoubtedly be materially diminished in future constructions.

Besides this diminution, as a sequence, in the cost of each of the remaining eight plans, it is believed that more close estimates would lead to further comparative reductions in the different cases.

The weights range from 117,000 to 143,000 pounds, or, say, from about 51.25 to 65 tons; a weight somewhat heavier than obtains in European constructions *where cast iron is not used*, but not resulting in a cumbersome or unwieldy model.

A full length of bore is secured for the caliber and our more perfected appliances for maneuvering enables us to handle the guns readily; besides, the additional weight moderates the recoil, and the emplacements being in permanent works on our sea fronts, a moderate increase in weight cannot be objectionable.

The English B. L. 12-inch gun (26 calibers long), recently constructed, and now on trial at Shoeburyness, is lighter in weight than our model; but it is a built-up construction of wrought iron and steel, and contemplates a charge of 285 pounds, whereas we count upon the full effects of a charge of 300 pounds, and the employment of a somewhat—we believe—superior powder. However, the systems presented in these plans have, it is thought, in their weight and dimensions, strength and capacity necessary to secure all the energy which can reasonably be expected to be obtained, besides a surplus of the former in reserve, for those emergencies always arising in service in which severe tests from inferior powders and overcharges are constantly to be met.

In reference to the materials to be employed and the modes of manufacture, the undoubted tendency amongst European nations is to resort to the superior metals, wrought iron and steel, built up in construction. To the latter feature there is no exception.

The English use steel tubes jacketed with wrought-iron casings shrunk on the former; the French, steel-fretted cast-iron guns, with interior steel tubes (but are experimenting—if not actually making steel guns—fully with steel as a substitute for cast iron); the Prussians and Russians use the well-known Krupp construction, and the Italian system is essentially one in which a cast-iron body takes the place of the steel one in the Krupp system; the fermeture being, however, after the French model, the only perfected breech-closing system which can be reasonably resorted to where a cast-iron body is used.

In no constructions, it will be seen, is cast iron the sole metal employed, and it would seem that to further contemplate its use, pure and simple, or essentially so, would, in view of the examples set by experimentalists and constructors, and the disastrous experiences both at home and abroad had with its exclusive use, be ignoring the lessons of the past, results of sound theory, and lead to repetition of experiments with a metal susceptible of a wide range of possibilities in endurance, and hence the results of whose tests would be simply unreliable. That the use of our more perfected powders may secure less liabilities than heretofore to explosive and unexpected rupture of pure cast iron may be true, but the unreliability of the metal will still remain undisputed; and the broad question—if this kind of construction has a sufficient surplus of strength to meet all the emergencies of service—the use of all reasonable kind of powders and variations of charges—would remain, even in the event of a successful trial, an unsettled one.

The Italian system—a cast-iron body banded with hoops of steel—is the nearest approach among modern construction to the use of cast iron, pure and simple. It is probably a cheap construction and was

originated through motives of economy. It differs from the French in the absence of interior lining-tube of steel, and it would seem from this cause must be—in accordance with the best accepted theories of construction—inferior in tangential strength to the latter; besides, the screw fermeture employed finds place in and is sustained only by the cast-iron body, whereas the interior lining-tube of the French system furnishes a steel bed for the breech-block, and, in its turn, is firmly locked in the cast-iron casing by a high-pitched screw-thread on the outside.

The latest Italian 100-ton gun, cast at Turin, has been tested, as will be seen from a recent number of the French Revue d'Artillerie, up to about 100 rounds.

An analysis of the record will, I think, however, show that the charges used were light compared to the caliber and volume of bore, and that the resulting power has not been in consequence as great as in accordance to our theories should attain in guns of a similar nature and built after our mode of construction.

Regarding the systems of breech closing presented in the inclosed drawings, the attention of the department is directed to the fact that but two varieties are shown, the round wedge and the slotted screw plug fermetures.

These are the only two modes known to the civilized world which have been thus far thoroughly perfected, and as they both meet excellently well all the requirements of a good breech-closing arrangement, and as it is hardly possible to suggest anything superior in simplicity and effectiveness, it was thought unnecessary to make any additional researches looking to the presentation of other systems. One feature in the construction of those plans herein presented which involve the use of interior tubes (Plan No. 1 is the type) is important and to which the attention of the department is especially invited. It is the relief of the interior tube from longitudinal strain, the breech-block in every instance working in the steel breech-receiver, and the longitudinal stress being primarily applied entirely to the latter and transmitted hence, however, to the cast-iron casing. The interior tube being thus unclosed at the rear end, has besides the tangential strain only a longitudinal stress to the front, produced, principally, by the powder gases operating on the shoulder of the chamber and the friction occasioned by the passage of the projectile through the bore. It is hence not subjected to the pulling-apart tendency which arises in those constructions, such as the Woolwich and Armstrong, where the interior tube receives the breech mechanism and thus closes the tube, in the act of firing, at the rear. The 100-ton Italian gun (Armstrong manufacture) which burst on board of the Duilio, was so constructed, and its thick steel interior tube closed at the rear by the breech-plug gave way, below the shoulder joining the bore and chamber, and carried with it, to the rear, sections of the shrunk-on wrought-iron jackets; these latter by connected together as to afford but little longitudinal support, and hence throwing almost the entire strain on the interior tube. Consequently I give decided preference in the presentation of these plans to those in which an interior lining-tube, *disconnected* with the breech mechanism, finds place. In concluding these remarks I would call attention to the fact that, in using interior tubes of superior metal to cast iron, to give the necessary strength to the system, that they should be sufficiently thick in their walls to reduce the strains, at the seat of the shot, on the cast-iron interior walls, to about one-third of the tensile strength of this metal; or, that is to say, taking the pressures produced by service charges, at 32,000 pounds per

square inch, the tensile strength of cast iron being about 30,000 pounds, the strain (according to Barlow's law, sufficiently accurate for practical calculations) should not exceed 12,000 pounds at the interior surface of the cast-iron body.

By calculation (Plan No. 1) we find the interior walls of the cast iron, at the seat of the shot, would be under a strain of about 10,000 pounds per square inch, or about one-third of the tensile strength of the metal. A far greater strain can be withstood by the cast iron, but a large surplus of strength is evidently the best if it can be secured at no special sacrifices in other important features in the construction. Tubes cannot be made so light as not to afford sufficient metal to make good rifle carriers, and it is evident the lighter the lining the more the strain will have to be borne by the cast iron.

There is no evading this issue, and hence the lighter the tube the more nearly does the construction approach one of pure cast iron, and become—if carried far—practically a cast-iron gun, subject to all its weaknesses and other imperfections; and to which may be added the defects arising from the difficulties of firmly securing a very light tube in the cast iron structure, and its liability to succumb to a tendency to displacement and rupture from pulling and other strains.

I am, sir, very respectfully, your obedient servant,

S. CRISPIN.

Brevet Colonel U. S. A., Lieutenant-Colonel of Ordnance.

Comparative statement of estimated weights and cost of proposed 12-*inch B. L. rifles.*

No. of gun plan.	Weight.	Cost.
	Pounds.	
I	123, 788	$46, 000
II	119, 537	44, 504
III	117, 312	43, 700
IV	116, 645	39, 444
V	124, 614	42, 479
VI	143, 196	48, 763
VII	124, 798	42, 573
VIII	143, 237	48, 884
IX	117, 219	39, 917

[First indorsement.]

ORDNANCE OFFICE,
August 13, 1881.

Respectfully referred to the Board of which General Getty is President,

Colonel Crispin's views in regard to the use of cast iron, pure and simple, meet my full concurrence. The entire civilized world has progressed far beyond it, and the great experience with built-up constructions of different types, throughout the continent of Europe, cannot be ignored in the determination of so important and vital a question as a proper system of heavy-gun construction.

While not claiming the most absolute perfection for the system adopted by the Department for the four 12-inch B. L. rifles now under contract, our trials with the 8-inch have proved its strength and reliability, and these constructions come within the facilities and capabilities of our own foundries.

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

L. R. No. 287.] OFFICE OF U. S. ORDNANCE AGENCY,
No. 146 GREENE, COR. HOUSTON STREET (ARMY BUILDING),
New York City, May 10, 1882.

General GEORGE W. GETTY, U. S. A.,
President Board on Heavy Ordnance, &c., New York City, N. Y.:

SIR: I desire to call the attention of the Board on Heavy Ordnance, &c., convened under act of Congress approved March 3, 1881, and of which you are President, to the inclosed two drawings, embodying in a general manner the more recent plan of Captain Schultz, of the French Artillery, for the division of strains in the construction of heavy cannon, both for naval and for sea coast armaments.

The caliber selected is 9 inch, and is intended as a purely experimental one. The only essential difference between the two sketches, as far as gun construction is concerned, is that one illustrates a steel body, or tube wrapped with steel wire and jacketed, and the other of the same body, but with a *jacketing and frettage* of steel.

A separation of the tangential and longitudinal strains at the bottom of the bore in gun construction has for some time been recognized (at least abroad) as a desideratum; and a sound practicable and compact plan for the solution of the problem, it would seem, promises to be furnished by the rod system employed by Captain Schultz, and its approval in France for the experimental wire guns now in process of completion at Lille, tends to confirm this opinion.

These guns have steel bodies—preferably Whitworth's fluid-compressed—and the wire one may be wrapped with the round wire of Schultz, or the rectangular cross-sectioned riband of Armstrong; and the modes of fastening the ends of the same may be any of the plans in vogue, after successful experiments have determined the efficiency and preferableness, in other respects, of the system to be employed.

It is recognized that a plan in which the union between the wire and its *point d'appui*, both at the beginning and end of winding, will at least have two-thirds of its tensile strength, will be sufficient; and I believe from the examinations made of the different plans alluded to above, that any one of them will satisfactorily attain the end. Steel wire, it is stated on good authority, can be produced up to 120 tons per square inch in tensile strength, and as it can be wound at a tension of, say, one-third its ultimate strength, we can have assured a tension of, say, about 90,000 pounds per square inch in its winding.

The wire for a 9-inch gun should, it is thought, not be less than 0.1 inch in diameter. Schultz employs a wire of 0.118 inch for his 34^{cm} gun. The number of wire sections, and the mode of securement of the necessary collars between which the sections are wound, must, as matters of detail, be left to the practical engineer. I have represented, principally, the Armstrong mode of construction in this respect.

The plan employed for the securement of the breech-block, and in which the fermeture works, and by which the division of strains alluded to above is attained, is, as above stated, a system of steel rods running through and secured (see plate) to the trunnion-block (enlarged in diameter more than ordinarily for the purpose), and extending to and through the breech-block, as shown by the drawings, the assembling of the whole being completed by *suitable nuts.*

The end or bottom of the body of the gun proper is recessed into the breech-block to center the block and act principally to prevent any tendency of this part to spread, under fire, by the interruption of continuity at this part of the system. The tendency in this system is evidently for

the trunnions, attached as they are to this independent block, to go to the rear, and the body of the gun to the front, but the large shoulder on the interior body bringing it under a strain of compression, is more than strong enough to resist this tendency. The shoulder can be a separate piece screwed in or otherwise attached, if desirable, for practical or economical reasons in construction, but it is believed, from an examination of flanged shafting, especially those produced by Sir Joseph Whitworth, that no difficulties need attain in this regard.

In the plan before us, we have eight rods of an aggregate area of cross-section of, say, 160 square inches; and assuming an excellent quality of steel to be employed, say capable of resisting 100,000 pounds per square inch, we have a total tensile strength of, say, 16,000,000 pounds. The area pressed (9″.5) at the bottom of the bore at 40,000 pounds pressure per square inch, will receive a total pressure of, say, about 2,800,000 pounds, or say the ratio of strength to the stress obtaining will be as about six to one. The elastic limit of the steel rods, in the aggregate, should not be reached under less than 85,000 pounds pressure per square inch, and that is rarely ever even an accidental phenomenon. In any event, the system (it may be at the expense of some sightliness and some appearance of cumbersomeness) is evidently susceptible of admitting all the strength necessary to resist abnormal strains beyond all the expectations or experience of modern gunners.

The steel construction is identical with the other in all details, and only differs from the other in being steel jacketed and hooped instead of being wired and hooped.

Both guns are susceptible of the use of the ordinary Broadwell system of obturation, but I have deemed it of some interest to the Board to present in Plan 1 a novel mode of obturation adopted throughout the French land service, and known as the system of "de Bange."

The Broadwell plan is too well known to need description, and I shall therefore confine myself to a few brief remarks regarding the device of Colonel de Bange.

It consists essentially in a collar (AA) made of a casing of linen, seamless, excepting the necessary closing seam on the inside of the collar next the rondelle (BB). It is filled with two-thirds asbestos and one-third mutton suet. This collar is encased in sheet zinc rings (CC) supplemented at the top and bottom by copper rings (DD). The collar placed between the "mushroom head" (BB) and the front end of the fermeture is forced out in the act of firing to the walls of the gun, and secures, it is claimed, complete obturation. It is easily placed, is cheap, and needs no recess for its reception or rather its seat. Its limits of successful action are evidently wider than the Broadwell ring; but whether it is equally successful in all conditions of service is a matter, I believe, for further experiment and test. It can evidently be applied for test without interfering with any plan looking to the use of the ordinary manner of obturation (Broadwell ring), as it can be used, as far as the gun is concerned, prior to its completion for the latter system.

It is hardly necessary to allude to the tangential strength of the systems presented, as steel and steel wire wrapped guns are believed to be the most promising constructions of all others projected or likely to be projected in the coming or near future.

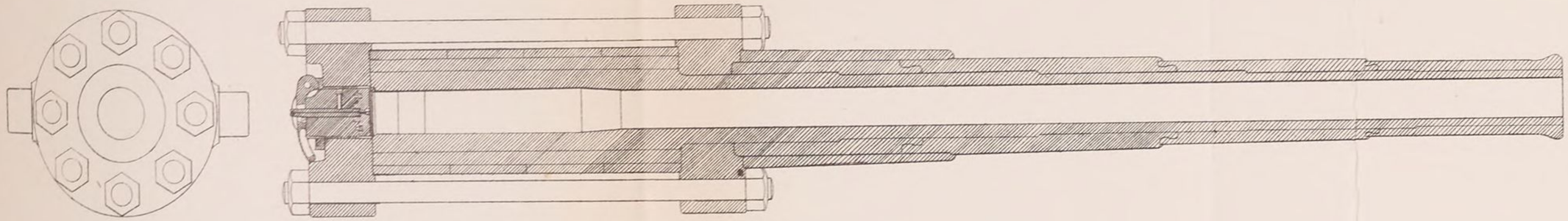
The caliber of 9-inch is taken, as it is believed that in the present state of our knowledge even here, that constructions up to 8-inch can be produced, and that our developments can be safely commenced with a 9-inch bore. This, however, is a matter somewhat of opinion, and is not of so grave importance as to lead here to any special discussion.

SKETCH OF PROPOSED 9 INCH B.L. STEEL RIFLE.

AFTER THE PLAN OF SCHULTZ FOR SECURING A DIVISION OF STRAINS.

WEIGHT 18 TONS — LENGTH OF BORE 30 CALS.

Scale 1/12.



——— LEGEND. ———

Weight of Rods (approx.)	2	Tons.
" " Tube "	3 ¾	"
" " Trunnion Block "	2 ½	"
" " Breech " "	3	"
" " Wire and Bands "	7	"
" (Total)	18 ¼	"

SEN. EX. DOC. No. 178, 1st SESS., 47th CONG.

Thirty calibers are assumed, and about an 18-ton gun is the result. Its power, of course, is intended to equal if not surpass any construction whatsoever of its caliber and weight. It is intended, therefore, as an embodiment of one of the strongest constructions that can be produced in the present state of the arts of metallurgy and the science of gun construction.

Details of construction are, of course, not alluded to here, as they must necessarily be left to those intrusted with the work of the preparation of plans.

It is evident that the rods can be distributed differently, if, on subsequent study, it may be so determined.

Wire guns especially can, it is believed, be soon produced in quantities in this country. The only part of the construction which will require some little time to supply from our own resources will be the steel bodies. They can, however, in the mean time, from the best knowledge at hand, be promptly secured from Sir Joseph Whitworth & Co., Manchester, England.

The cost of steel construction, as afforded from European sources, is 51 to 60 cents per pound, Krupp; 38 cents per pound, Whitworth; 30½ cents per pound, Woolwich guns, and 48 cents per pound for 24^{cm} steel land-service ordnance of France.

The rods and some other parts, it will readily be seen, can be replaced if desired.

Very respectfully, your obedient servant,

S. CRISPIN,
Brevet Colonel, U. S. A., Colonel of Ordnance.

S. B. DEAN.

L. R., No. 75.] 34 CONCORD SQUARE,
Boston, July 12, 1871.

BVT. Maj. GEN. GEORGE W. GETTY, U. S. A.,
President of the Board on Ordnance:

SIR: In the Metallurgical Review for May, June, and July, 1878, Mr. Alex. L. Holley has admirably described the Terrenoire steel, its manufacture and its qualities.

1st. Sound steel castings are made.

2d. Annealing produces the effect of hammering and rolling.

I would specially commend to the notice of your honorable Board his remarks upon ordnance in the July number. He expresses the opinion that excellent ordnance can be made by this method at one-third the cost of hammered steel.

It is stated in "Iron" of December 5, 1879, that two unhammered, unrolled plates of Terrenoire steel, about 13¾ inches thick, were tested at Gavre, and that they withstood both direct and oblique fire better than did the hammered and rolled plates from Creusot.

Why should not the Government institute a series of experiments, under the direction of some competent metallurgist and engineer, at some steel works provided with large Siemens-Martin furnaces, to ascertain the best alloys of iron, treatment, effect of annealing on thick castings, best materials for molds and cores, their preparation, &c.

At present, estimates of cost will differ greatly for want of this practical knowledge, which, once obtained and disseminated, would probably

enable the government to procure its ordnance at the cost indicated by Mr. Holley.

In the design for a 10-inch gun here submitted, I estimate that the rough casting of Terrenoire steel for the body of the gun will weigh about 63,000 pounds, and would require two 20-ton furnaces. Steel of medium quality, containing about 0.45 to 0.42 per cent. of carbon; elastic limit not less than 20 tons, and 15 per cent. of extensibility.

A lined gun should safely sustain an internal strain of 40 tons per square inch and insure a muzzle velocity of 2,000 feet per second. Perhaps the breech-closing parts might be made of manganese bronze.

Many details I have omitted, and have attempted only to outline a comparatively cheap, plain gun for hard service. The rifling I would adapt to Captain Butler's projectiles.

I propose the following changes in E. A. Sutcliffe's breech mechanism. I make as follows, viz:

1st. A breech block fitted loosely in a rectangular slot in the gun and guided by a beveled rail and moved by the rotation of the breech screw. To this block is permanently attached a loading tube.

2d. A hollow breech screw, considerably larger in diameter than the height of the slot, and rotated by means of a worm-gear, worm-shaft, and crank.

I describe as follows, viz:

In the edge of the screw I fix firmly two pins or studs projecting from the face of the screw, nearly opposite each other, and at the same radial distance. These pins are fitted so as to move freely in a rectangular groove turned out in the rear face of the block. They thus hold the block and keep it in the axis of the gun. A shallow countersink is made in the face of the screw fitted to receive the rear end of the block. When the screw is tightened the block is then pushed forward into contact with the gas-check.

This slight final and forward movement I regard an essential part of the closing of the gun. To permit this forward movement the rear side of that part of the rail upon which the block rests is cut away, making that part or portion of the rail narrower than the transverse groove in the block.

The rest of the rail fills the groove, so that when the block is moved or slid outward it cannot rub against the front of the slot.

The rail is beveled to cause the block to recede from the gas-check when the screw is loosened.

It will be seen that no transverse movement of the block can occur while any pressure remains from the screw, thus preventing abrasion of the gas-check.

I use a drawbar or hooked link to connect the screw and block, to give a transverse movement to the block.

This drawbar is hinged by a bolt to the loading tube, and may be placed above or below the tube as may be preferred. In the drawing I have placed it above the tube. If the block was turned over and the position of one of the pins changed, the transverse movement could then be made with the same facility as if the opposite side up.

Upon the rear end of the screw I bolt a worm-gear and fix to the gun a worm-shaft with a crank for operating the same.

To open the bore for loading.—Turn the crank backward. One of the pins is moved downward out of the groove and into the space *below* the block, while the other pin is moved upward, and as it moves out of the groove into the space *above* the block it hooks on to the drawbar and pulls the block outward against a stop fixed in the slot. The loading

tube now coincides with the bore of the gun and is ready for sponging and loading.

To close the bore for firing.—Reverse the movement of the crank. As the upper pin is hooked to the drawbar the block is pushed back into its seat in the gun. Then the pin unhooks from the drawbar and moves into the groove. The opposite pin has also entered the groove, and thus the block is held in the axis of the gun while the screw is tightened upon it. The gun is now ready for firing.

I suppose that each movement of opening and closing will occupy from 10 to 15 seconds of time.

Very respectfully, yours,

S. B. DEAN.

L. R., No. 173.] 34 CONCORD SQUARE,
Boston, October 5, 1881.

Maj. Gen. GEORGE W. GETTY,
President of the Board on Heavy Ordnance:

SIR: In July last I had the honor to send you drawings and a description of a steel breech-loading 10-inch gun. I now send a model and corrected tracing of the same.

I have a notion that a simple steel casting of an entire gun, annealed and having a thin lining for the powder chamber, would fulfill all the requirements of an efficient and inexpensive gun; but at present it might be more difficult to cast than this. Originality of design is not attempted, only a practical plan, which will enable existing steel works in the United States to furnish guns with sufficient power to penetrate most of the iron-clads now afloat. No doubt a trial might show where improvements were necessary, but I think the cast and annealed gun would be adhered to.

A gun cast *breech upward and cored out*, from steel nearly free from phosphorus and having 0.45 per cent. of carbon, would have twice the strength and thirty times the extension of cast iron.

A paper recently read before the Institute of Engineers and Ship-Builders of Scotland, and reprinted in Van Nostrand's Magazine for the current month, gives some facts confirming Mr. Holley respecting Terrenoire steel.

It states that steel at the Hallside Works is every day cast, free from hard spots and blowholes, which can be forged cold or hot, and welded; of a strength of 29 to 35 tons, and 17 to 6 per cent. extension in lengths of 8 inches; an elastic limit of one-half to five-eighths in breaking strain; and is never too hard to finish.

Breech mechanism.—In the rear end of the breech screw, and parallel to its axis, are drilled several holes, in any two of which bars of iron may be inserted. These will hold the end of a lever of a convenient length to release the screw, if, after firing, it should stick.

The thread of the screw will be about 600 inches in length, $1\frac{1}{4}$ inches thick at the root, and a depth of six-tenths inch, and a bearing surface of 360 square inches.

A pressure in the bore may be possible of 40 tons per square inch. This will be about twice the average pressure produced by full charges giving muzzle velocities of about 2,000 feet per second.

The pressure of 40 tons will produce a total pressure upon the screw of about 5,000 tons, and $\frac{5000}{360}$=14 tons per square inch of thread.

A pitch of $1\frac{3}{4}$ inches will make the angle of the developed thread about 1° 35′.

The actual surface of the screw which is covered by the breech-block when the gun is closed is about 188 square inches, and $\frac{5000}{188}=26\frac{5}{8}$ tons compressive strain per square inch.

The lining tube terminates at the bottom of the bore.

A transverse section through the gun at the rear end of the slot contains about 425 square inches, and $\frac{5000}{425}=12$ tons tensile strain per square inch.

After it has been bored for the lining tube, and threaded for the screw, it will be slotted for the block. With the exception of the rail, the slot may be finished without regard to strict accuracy. The corners may be left as a large drill would make them.

I think I may claim that the mechanism is simple, with plain bearing surfaces easily rectified without delicate machinery; that it is tolerably well protected from external injury, and will not be likely to get disabled.

I have no data from which to estimate the cost of guns made in this manner, but suppose (provided the first was found satisfactory after proof) the first ten might cost $25,000 each.

I would like this to be considered a part of, or appendix to, my communication of July.

Very respectfully, your obedient servant,

S. B. DEAN.

L. R., No. 230.] A. H. EMERY.

Statement of gun construction and cost of new gun constructions, submitted by A. H. Emery.

Guns—Nos. 1, 2, 3, 4, and 5.

Gun 1. This has two main steel pieces at breech, both cast solid, well hammered, then bored and oil-tempered, and so assembled that the outer one of these two is under heavy longitudinal strain of tension, and the inner one heavy longitudinal strain of compression.

The outer one of these may, perhaps, well be replaced with Terrenoire steel, and possibly the inner one also, without reducing the strength so much as the cost; should either of these be of this steel the cost will be sensibly reduced. If the inner of these pieces were made of this steel it would be cast solid, then annealed, bored again, annealed, and oil-tempered. The outer one might perhaps be cast solid. There is only one piece of cast-iron in this gun, and that is the chase, weighing 38,350 pounds.

Gun 2.—This gun is the lowest-priced of all presented for 12-inch, and requires the least expensive plant, and has excellent strength for one of this cost.

In construction, its main body is of cast iron, water cored, breech up, bored, turned, and lined with steel bands and barrel.

Gun 3.—This gun costs from 10 to 15 per cent. less than No. 1, but like it has the breech entirely made of steel; it differs from No. 1, mainly, in having but one main piece in the breech to take the longitudinal strain, and is lined with three thicknesses of interior lining, instead of two as in No. 1.

The main body, at the breech, is made of hammered steel, or Terrenoire steel; in either case it is cast solid, and bored and tempered in oil. If made of hammered steel, the gun will cost 10 per cent. more than if this piece be made of Terrenoire steel. The outer chase is of cast-iron, like that of No. 1.

Gun 4, 16-*inch*.—This gun is best for all constructions larger than 12-inch, and might well replace No. 2 for that size.

The plant for this construction, for bores of 16-inch and 20-inch, would be vastly less expensive than that required for 16-inch and 20-inch of the kind shown in No. 1.

On the other hand, when we are well experienced in making and working Terrenoire steel, it may be replaced by either No. 1 or No. 3, by using this steel for all the larger parts.

As now shown, it is intended for the main body to be made of cast iron, breech up, water cored, lined, and banded, but the bands may be omitted if desired. There is but the one piece of cast iron mentioned. The chase is all steel, the outer part of Terrenoire steel, annealed and oil-tempered.

With the construction shown in this gun, we can eventually go to 20 inches more easily than we could to 16 inches in the plan shown in No. 1. The efficiency of this gun is great, much more so than that of any yet made.

Gun 5, 10-inch; weight 59,100 pounds.—This gun is like No. 1 except in size and in having its outer chase of steel instead of cast iron, as on Nos. 1 and 3. This increases its cost 10 to 15 per cent. and reduces the weight in about the same proportion, which makes it better for the Navy and possibly for the Army. Nos. 1 and 3 may be modified this way by adding 10 or 15 per cent. to their cost at present, and eventually by a somewhat smaller increase of cost as we progress further in the use and production of Terrenoire steel, of which the outer chase is made.

Nos. 1, 2, 3, 4, and 5.—All have their chambers made of condensed bronze or steel, or of steel oil tempered.

All have their bores lined front with well-hammered oil-tempered steel. But this part may eventually be replaced by Terrenoire steel, cast solid, bored, annealed, and oil tempered.

The inner and outer lining bands of all these guns are of crucible or open-hearth steel, forged solid in large bars, cut up in short lengths, a hole then punched through them, after which they are further condensed, refined, and marked out to the desired form and size by the aid of the hammer, rolls, and lathes. They are thus made very strong for tangential strains which are those mainly put upon them. They are all oil tempered, and have high limits of elasticity and high breaking strength.

Those used for lining rings are all under compression, except some of those in guns 2 and 4, where some of them are under tension; all the outer ones in guns 1, 3, 4, and 5, are under high strains of tension.

Breech-plugs.—These in all guns do not differ greatly in weight from that of the wedge used in the 12-inch now being constructed by the Ordnance Department, but are somewhat lighter, and vastly stronger, though acted on by less powder area than in the ordnance gun mentioned, but greater areas than in the small chambered French guns of same bores, and somewhat simpler breech apparatus.

COST OF THE GUNS.

No. of gun.	Ordinary cost.	Experiment'l.
Gun No. 1	$60,000 to $75,000	$100,000
Gun No. 2	40,000 to 45,000	60,000
Gun No. 3	55,000 to 68,000	95,000
Gun No. 3, hammered steel, breech body	50,000 to 62,000	85,000
Gun No. 4, Terrenoire steel, breech body	100,000 to 125,000	200,000
Gun No. 5		

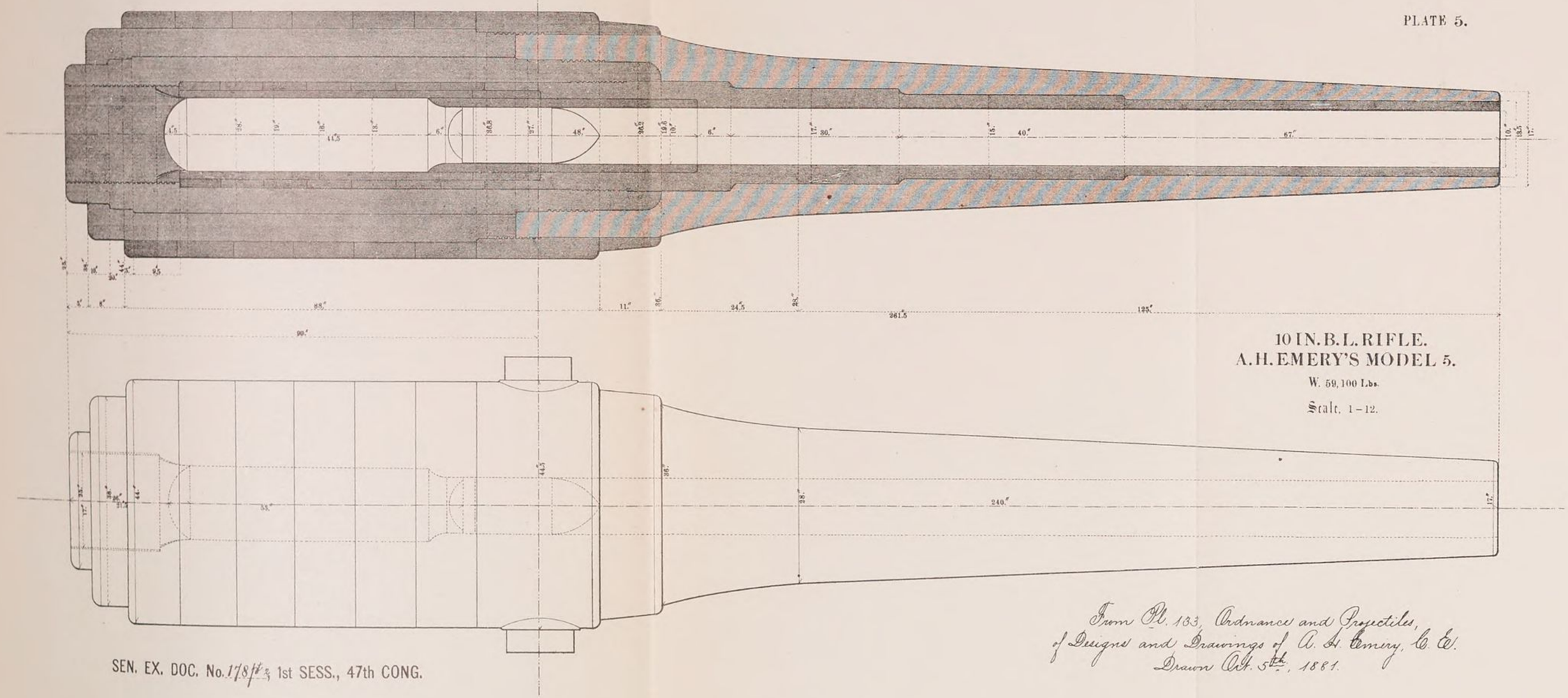
WEIGHTS.

No. of gun.	Cast iron.	Steel and bronze.	Total.
	Pounds.	*Pounds.*	*Pounds.*
Gun No. 1	38,350	78,930	117,280
Gun No. 2	70,200	45,900	116,100
Gun No. 3	38,700	78,300	117,000
Gun No. 4	142,840	157,160	300,000
Gun No. 5		59,100	59,100

The cost of these guns may be modified, always remembering that increased orders and production make cost less.

A. H. EMERY,
Per RAQUÉ.

PLATE 5.



10 IN. B. L. RIFLE.
A. H. EMERY'S MODEL 5.
W. 59,100 Lbs.
Scale, 1–12.

From Pl. 183, Ordnance and Projectiles,
of Designs and Drawings of A. H. Emery, C. E.
Drawn Oct. 5th, 1881.

L. R., No. 164.] J. R. HASKELL.

NEW YORK, *October* 5, 1881.

General GEO. W. GETTY,
President, and the Board on Heavy Ordnance and Projectiles:

GENTLEMEN: I have the honor to submit to the consideration of the officers of the Board copies of the working drawings of the 6-inch Lyman-Haskell accelerating or multicharge gun, and of the shot and gas-check wad to be used with the gun. I send also herewith printed statements and arguments in relation to the subject, to which your attention is most respectfully directed.

This gun is an improvement on the one presented to the Board on Heavy Rifled Ordnance appointed under the act of Congress of 1872. That Board recommended this gun to be experimented with at the expense of the government, so far as the entire expense of projectiles, gas-checks, powder, and all the expenses attending the experiments, but not the cost of the gun, which had already been built and paid for by the owners.

The proceedings on this subject can be seen in full in the report of the Chief of Ordnance for the year 1872. The recommendations of that Board were not fully carried out for the want of funds, although the Ordnance Board have asked Congress to appropriate money for that purpose every year since.

There were certain faults in the design of the 6-inch gun which was submitted to the Ordnance Board for trial which the undersigned set forth in a printed memorandum to the Board.

Since that time the owners of this gun and its improvements and patents have commenced the construction of a 6-inch gun at the Scott Foundry, at Reading, Pa. The steel for the tube of this gun was made at the Midvale Steel Works, at Nicetown, Pa. The tube is now being bored, rifled, and finished at the West Point Foundry, at Cold Spring, N. Y. This gun contains all the recent improvements, and avoids the faults of the 6-inch multicharge gun submitted for trial, and now at Sandy Hook. The Board will see all the improvements, the plan of the gun, and full details in the copies of the working drawings herewith submitted. The slot and gas-check wad for this gun are also fully illustrated in the drawings of the same herewith sent.

The total amount of powder intended for one charge in this gun is 130 pounds, divided as follows: Eighteen pounds of hexagonal powder in the breech, and 28 pounds of a quicker burning powder in each of the four additional charge chambers or pockets. The projectile, four calibers long, will weigh 150 pounds. This is the length we propose to use, although we may try some three calibers long, weighing 100 pounds.

Experiments will demonstrate which is the best length to use. We have used with success in the $2\frac{1}{2}$-inch bore Lyman accelerating gun, shot 6 and 7 calibers long. I am of the opinion that with the initial velocity we can give to a shot by this system of successive charges of powder, and with the proper twist, that shot of 5 calibers in length will give much better results in penetration, particularly at long range, than shorter shots. I am aware that this would not be the case with single charge guns, but we can accomplish results with the multicharge guns impossible of accomplishment with single charge guns.

It will probably be found on experiment that a 9 inch multicharge gun with a shot 5 calibers long can be made to penetrate much more iron, at a distance of one mile, than any single charge ever constructed, no matter how large. The gun now in course of construction at the Scott Foundry will be finished some time during the coming winter, and will cost a large amount of money, which is all furnished by the owners.

In view of the importance of the subject, and what has already been accomplished, this gun is worthy of government aid.

A board of competent officers have already so considered and have so recommended, which has not yet been had for want of funds.

I therefore respectfully request your honorable Board to recommend that the government furnish transportation for this gun from Reading, Pa., to Sandy Hook, and that all the expenses of the tests, including shot, gas-cheeks, powder, and all the expenses of mounting the gun be borne by the United States.

The gun is being made with trunnions, the same dimensions as those of the 8-inch converted rifle from 10-inch smooth-bore gun.

All of which is respectfully submitted.

Your obedient servant,

J. R. HASKELL.

[Inclosure.]

THE LYMAN-HASKELL ACCELERATING OR MULTICHARGE CANNON.

The theory of this invention is the gradual accumulation of velocity or power by a succession of charges of powder exploded behind the projectile as it passes along the bore of the gun.

The inertia of the shot is first overcome by a moderate charge of coarse-grained, slow-burning powder, and then repeated charges of quick-burning powder are applied in succession until a greatly increased velocity is attained.

In the single charge gun the effort has been to strengthen the breech, so as to admit of the use of a larger charge of powder.

By the accelerating principle ten times as much powder can be applied, and yet the maximum pressure in the gun is not increased. Instead of placing all the strain upon about two feet of the metal at the breech, by this process the strain is distributed along the entire length of the gun. A longer and heavier projectile can be employed, while, at the same time, it can be modeled in a form better suited to overcome the resistance of the air, and to retain a higher velocity for a longer time.

The most notable of the single charge guns are the 81-ton Woolwich gun made by the British Government, the 100-ton gun made by Sir William Armstrong for the Italian Government, and the large cast-steel guns made by Krupp. The maximum charge used in these guns is a little less than one-fifth the weight of the projectile.

In the experiments with rifled guns made by officers of the army in this country, no greater charge has been used than one-fifth the weight of the projectile, which, therefore, may be considered the maximum for a single charge gun.

In the multicharge guns, charges of powder one and a quarter times the weight of the shot have been used with safety and advantage.

The only improvements made in single charge guns in Europe, where

the greatest advances have been made of late years, are, first, by making the guns of stronger and more expensive material, requiring greater skill and more expert workmen; second, by "chambering" the gun, *i. e.*, making the powder chamber larger than the bore of the gun; third, by strengthening the breech through the use of concentric rings or tubes of different kinds of metal; and, fourth, by so improving the manufacture of the powder as to make it burn more slowly, in order to start the shot before the full force of the gas is developed.

These improvements have made it possible to increase the amount of powder burnt in single charge rifled guns from one-tenth to one-fifth the weight of the projectile when the shot is made of the usual length, which is a little less than three calibers.

It is manifest that whatever advantage can be gained in single charge guns by "chambering" and by the use of improved powder can be gained in the multicharge guns also. We can avail ourselves of these advantages not only in the breech of the multicharge guns, to such extent as may be desired, but also in the supplemental charge chambers, by which means we secure immense power and velocity. We do not propose, however, to use so large a charge in the breech as is used in the single charge guns. It is not necessary with these guns to apply so great a pressure in the breech, as we have a reserve force to draw upon after the breech charge has accomplished its principal work—the overcoming of the inertia of the projectile.

Numerous experiments have been made during a series of years in perfecting the multicharge system, some of which were made privately, while others were made before boards of officers of the Army and Navy, were officially reported on, and are, therefore, of record. All these experiments have demonstrated the superiority of the multicharge over the single charge guns. Some of these experiments were made for range, others for penetration, and still others for initial velocity. In referring to a few of these many experiments I will first direct attention to those made for penetration.

A test was made at the navy-yard in Washington between a 5-inch bore English Whitworth gun and a 2½-inch bore multicharge gun, both being fired at the same target and from the same port-hole. The target consisted of wrought-iron plates 5 inches thick, backed by 18 inches of solid oak timber. The distance from the guns to the target was 200 yards.

The Whitworth gun was fired first. Three shots were fired with the following charges:

Shot.	Weight of powder.	Weight of shot.
	Pounds.	*Pounds.*
First	12	80
Second	14	80
Third	18	80

The projectiles in all these cases remained sticking in the iron, not one of them entirely penetrating it. At the third fire the gun cracked entirely through its body, the crack extending forward about 3 feet from the breech, leaving the gun a total ruin.

The 2½-inch multicharge gun was next fired from the same port-hole with the following charges:

No. of shot.	Charges of powder.				Total powder.	Weight of shot.
	Breech.	First pocket.	Second pocket.	Third pocket.		
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
First	¾	1¾	2	2¼	6¾	16
Second	¾	1¾	2	2¼	6¾	19¾

The first shot was made of soft steel. It struck the target and broke into pieces, the largest piece remaining in the target. The second shot, which was made of hard steel, struck the target true and did not break. According to the official report it went "entirely through the 5-inch iron plate and the 18 inches of solid oak timber, and struck the water about 100 yards in the rear of the target, making a hole through the iron plate of about its own diameter."

It will be observed that the Whitworth single-charge gun did not penetrate one caliber into wrought iron—*i. e.*, once the diameter of its bore—while the multicharge gun penetrated *more than two calibers.*

By reference to the official report of the penetration of the best European guns, made since the above trials, it will be found that the penetration has been a little increased. Experiments have been made in Europe with guns varying in bore from 7 to 17 inches, at targets representing the armor of the ships of the British and other navies. A table of the results obtained was published in the annual report of the U. S. Chief of Ordnance, January 1, 1879. It was found that the penetration of these guns—with only two or three exceptions—into wrought iron, at the distance of 70 yards was one caliber. The largest Armstrong guns (81-ton and 100-ton) have penetrated nearly 1½ calibers into wrought iron, so that 1½ calibers may be called the maximum penetration into iron armor of the largest and most powerful of modern single-charge guns with the most improved modern powder.

The 2½-inch multicharge gun before referred to was afterwards fired at a target made of eleven wrought-iron plates, each one inch thick, bolted together, and representing a section of the original Monitor turret. One shot was fired at this target with charges and result as follows:

Charges of powder:	Pounds.
Breech	1
First pocket	2
Second pocket	2½
Third pocket	2½
Total powder	8
Weight of shot	19¼

The shot struck the target and was broken, several pieces being thrown off, the main portion, however, penetrating through seven and one-half plates, making a hole 3 inches by 3¼ inches. The character of hole made showed that the shot "wabbled"—*i. e.*, was not revolving true on its longitudinal axis, which accounted for its breaking and cutting a hole larger than its diameter. The penetrating power of a projectile is not as great when it breaks as when it remains intact and finishes its penetration. The projectiles used in these trials were very long (being 6 or 7 calibers in length), and its "bearing" (the point at

which it filled the grooves in the gun) was at its extreme rear end. This caused the front end of the projectile to drop, and the shots were not, in consequence, always delivered at the muzzle perfectly true. This would naturally cause the shot to "wabble" until after it had revolved on its axis a sufficient length of time to right itself. This is why a *rifled* shot will, in many cases, penetrate farther into iron at some distance from the gun than immediately in front of the muzzle. In this last experiment the shot penetrated 3 calibers, and at the same time cut a hole 3 by 3¼ inches, which was considerably larger than the diameter of the shot. Had the shot been going "true," it would have cut a hole of its own diameter, and would consequently have made a greater penetration.

Those trials were for *penetration*. The total charges of powder were, in each of the first two shots, 6¾ pounds, and in the last 8 pounds. Since that time, in trials for *velocity*, with the same gun, before the Ordnance Board, at Sandy Hook, we have used 2 pounds more of powder, making a total charge of 10 pounds of powder. Had the gun been charged up to its full capacity in the trials for penetration, as it has been since, and had the shot struck true, it is evident that the penetration would have been 4 calibers.

Since these experiments were made improvements have been effected which will insure the shot being delivered true in all cases.

By reference to the report of experiments for velocity made at Sandy Hook, it will be seen that where the total charge of powder used was 6¾ pounds (the same as had been used for penetration), the initial velocity of the shot was 1,593 feet per second, and that when the total charge was 8 pounds, the velocity of the shot was 1,742 per second. Subsequently when the total charge was increased to 10 pounds, the velocity was increased to 1,929 feet per second. It is therefore obvious that had we used, in the trials for penetration, the 10-pound charge (instead of 6¾ pounds or 8 pounds) the penetration would have been 4 calibers.

It should be noted at this point that the 2½-inch gun had only three supplemental charge chambers, while subsequent experience has shown that four pockets can be advantageously used. A fourth pocket in the foregoing experiments would have considerably increased both the initial velocity and penetrating power of the shot.

The results of the test made at the navy-yard at Washington, where a 2½-inch bore multicharge gun penetrated much more iron than a 5-inch bore Whitworth single-charge gun, substantiate the correctness of General Newton's calculations that *the 10-inch and 12-inch multicharge guns* will penetrate more iron than the *16-inch and 17-inch single-charge guns*.

Since the experiments heretofore referred to were made, additional experiments have been made with a multicharge gun of half-inch bore, for the purpose of securing a higher velocity. The projectiles used were of steel, 18 calibers (9 inches) long, and, even with this great length, attained a velocity of 3,000 feet per second, and penetrated 10½ calibers (5¼ inches) into wrought iron. Besides the initial charge, this gun had 5 additional charges of powder, which accounts for the enormous velocity and great penetration.

The description of that gun and details of experiments are as follows:

Diameter of bore one-half inch; length of gun, 10 feet 10 inches—having five charge-chambers or accelerators in addition to the initial (or breech) charge. The projectile was of hardened steel, pointed at the front, flat at the rear, the diameter being scant one-half inch, and the length

8 to 9 inches. The gas-check used consisted of several thicknesses of leather, making a wad of about one inch in thickness. The targets were as follows: One made of 12 plates of best boiler iron (each plate a little over three-eighths of an inch thick), all bolted together, and measuring when so bolted $5\frac{1}{4}$ inches in thickness; another made of a solid plate of wrought iron of the best quality, $4\frac{1}{8}$ inches thick, and backed by a block of oak timber placed endwise to the plate.

The following table gives the results of the experiments:

No. shot.	Breech, drms.	Pocket charges.					Total powder, oz.	Weight shot, oz.	Penetration.
		First, drms.	Second, drms.	Third, drms.	Fourth, drms.	Fifth, drms.			
1	4	10	26	26	26	26	$7\frac{6}{16}$	$7\frac{1}{4}$	$10\frac{1}{2}$ plates.
2	4	12	28	28	28	28	8	$7\frac{1}{4}$	12 plates.
3	4	12	29	29	29	29	$8\frac{1}{4}$	$6\frac{1}{2}$	$4\frac{1}{8}$ iron, $3\frac{1}{2}$ oak.
4	4	12	30	30	30	30	$8\frac{1}{2}$	$7\frac{1}{4}$	12 plates and over.

Shot No. 1 penetrated 10 plates and went half through the 11th plate.

No. 2. The point of the shot protruded through the 12th plate.

No. 3. This shot was fired at the solid iron plate, backed by white oak; it passed through the iron plate and penetrated $3\frac{1}{4}$ inches of the oak.

No. 4. The shot penetrated the 12 plates, the end projecting $2\frac{3}{4}$ inches beyond, making over $4\frac{1}{2}$ inches penetration into wrought iron.

It will be observed that, even where the projectile was eighteen calibers (9 inches) long, the smallest total charge of powder weighed more than the shot, and yet every addition made to such charge added to the velocity of the shot.

The pocket charges are ignited at their front ends, and the hot gas from the breech charge being driven entirely through them, none of the powder can pass out of the gun before combustion. It will be seen, therefore, that *all* the powder in this gun is utilized; and, as shown in the above experiments, every addition to the charge increases the velocity.

According to calculation the one-half inch shot, weighing $7\frac{1}{4}$ ounces, and fired with $8\frac{1}{2}$ ounces of powder, had an initial velocity of 3,000 feet per second, and would require that velocity to penetrate over $4\frac{1}{2}$ inches of wrought iron.

By this system it is possible to give an initial velocity of 3,000 feet per second to a shot 12 inches in diameter and 3 feet long, or even to a larger shot. Such a projectile, thrown with such a velocity, would, for the purposes of warfare, be practically irresistible.

The $2\frac{1}{2}$-inch *multicharge* gun had but three additional charges besides the initial charge. The guns we now propose to make will have four additional charge chambers besides its breech charge, and it is evident that they will penetrate easily 4 calibers.

It having been already shown from the official records that the best European guns can only penetrate one caliber and a half, it is clear that the relative power of the *single-charge* to the *multicharge* gun is as $1\frac{1}{2}$ to 4.

The gun used in the experiments here referred to was a Lyman accelerating gun of $2\frac{1}{2}$ inches bore, having three charge-chambers in addition to that in the breech. The experiments were made before the

United States Ordnance Board at Sandy Hook, and the results are here quoted from the official record on file with that board:

Results of increased charges.

	Number.	Breech.	First pocket.	Second pocket.	Third pocket.	Total charge of powder.	Shot.	Initial velocity.
						Pounds.	*Pounds.*	*Feet.*
February 9	1	¾	1¾	2	2¼	6¾	8	1,593
	2	1	2⅓	2⅓	2⅓	8	8	1,725
	3	1	2⅓	2⅓	2⅓	8	8	1,742
	4	1½	2¾	2¾	2¾	9¾	8	1,815

Results reached by use of pocket charges.

	Number.	Breech.	First pocket.	Second pocket.	Third pocket.	Total charge of powder.	Shot.	Velocity.
							Lbs. o	
February 18	1	1⅓	------	------	------	1⅓	8	1,235
	2	1½	2⅜	------	------	4¼	8	1,547
	3	1½	2⅜	2¾	------	7	8	1,830
	4	1½	2⅜	2¾	3	10	8	1,929
	5	1½	2⅜	2¾	3	10	8	1,921
	6	1½	2⅜	2¾	3	10	10 3	1,880

The powder used in the breech and all the pockets in the experiment recorded in the first table (that of February 9) was coarse, slow-burning powder.

The powder used in the experiments recorded in the second table (February 18) was *mammoth powder* in the breech and *musket powder* in the pockets. The powder was not proved previous to being used, and from the appearance of the musket powder, Major McKee, the member of the Board present, expressed the opinion that it was of inferior quality.

The experiments, however, show that each additional charge of powder added to the velocity of the shot, and that each increase of the charge in each of the charge-chambers correspondingly increased that velocity.

With the exception of the trial of the half-inch-bore gun, all the experiments referred to in this paper are official, made before officers of the Army or Navy, and are on record. The half-inch gun is now at the store of Herring & Co., safe manufacturers, corner of Broadway and Murray street, New York City, with the targets containing the projectiles, and can be seen at any time.

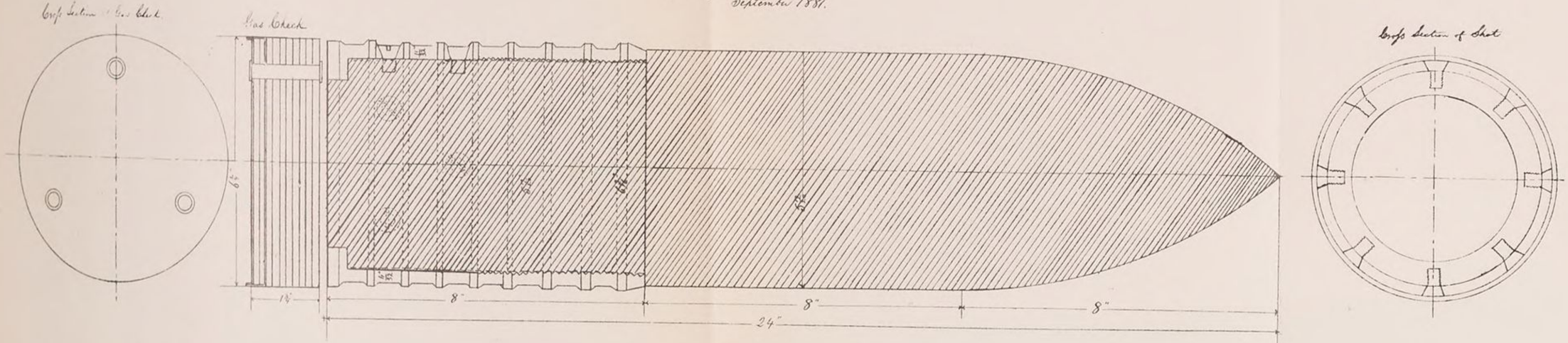
These experiments clearly demonstrate the practical success of the multicharge principle as applied to ordnance, and show that one of these guns has more than double the power of any single-charge gun.

J. R. HASKELL,
Superintendent.

Table of proposed weights of charges of powder and shot for accelerating guns.

Caliber of gun.	Weight of powder in pounds.						Weight of shot.	
	Breech.	First pocket.	Second pocket.	Third pocket.	Fourth pocket.	Total powder.	Three calibers long.	Four calibers long.
6-inch	18	28	28	28	28	130	100	150
8-inch	30	70	70	70	70	310	250	351
10-inch	50	135	135	135	135	590	476	679
12-inch	80	220	220	220	220	960	822	1,175

Shot and Gas Check for 6" Lyman – Haskell Gun.
Weight 150 lbs.
Designed by J. R. Haskell
September 1881.



SEN. EX. DOC. No. 178, 1st SESS., 47th CONG.

C. A. HOTCHKISS.

L. R., No. 243.] BRIDGEPORT, CONN., *February* 6, 1882.

General GEORGE. W. GETTY,

President of Board on Heavy Ordnance and Projectiles,

Army Building, corner Greene and Houston streets, New York:

SIR: I desire to submit to your Board for examination and consideration, in behalf of Mr. B. B. Hotchkiss, his patent projectile for breech-loading guns. The inclosed tracing shows an 8-inch projectile, full size (in section). I have also sent a sample 8-inch projectile, finished to the proper size.

The improvements in this projectile apply to projectiles for breech-loading rifle guns of all calibers in which there is a belt or packing of softer metal enveloping a body of cast iron or other different material. In common with other projectiles of this class, a belt or packing band of sufficiently large diameter to fill or about fill the rifle grooves, and allow a belt or band to take the impression on entering the rifle portion of the gun. This allows projectiles of the right caliber to be used in guns having various numbers and width of grooves.

A is the body of the projectile, made of ordinary cast iron or steel. B is the packing belt or band, of suitable width for the caliber of projectile to be used, and is compressed inward at the front and rear edges, so as to engage firmly with the shoulders at the front and rear edges of the packing-seat A′. This packing-seat is formed with four or other desired numbers of rings, *a*, which rings are either cast sufficiently perfect or are afterward finished to exactly the diameter to hold the packing belt or band out to the proper extent to fill the rifle grooves or take a proper hold therein. Between these rings or ridges, *a*, the packing-seat is more depressed, as indicated by A′. (See drawing.) When the gun is discharged the gases resulting from the combustion of the powder flow inward at an immense pressure in the thin annular space between the projectile and the interior of the gun. Practically none of this gas gets between the belt or band and body of the projectile, but all passes in the exterior of the belt or band, forcing the packing inward against the body, the belt or band assuming a corrugated surface. Thus conditioned, the projectile moves forward into the rifled part of the bore, and the bands of the gun are impressed, not on the entire surface of the packing, but only on the ridges which extend around the packing, over and accurately conforming to the ridges or rings *a*, thus giving the projectile a rotary motion. In case of very long projectiles, two belts or bands would be used, leaving an unpacked space between them. But in such cases, as with the single belt or band, each would be formed with the alternate ridges and depressions in the seat for the packing, applying the packing as a plain belt or band, allowing it to be molded into the seat in the act of firing. Experiments indicate that a very moderate amount of bearing surface, properly distributed, is sufficient for the well working of the projectiles. These projectiles have been used and tested by the Ordnance Board at Sandy Hook, N. J., and I would respectfully refer you to them for the records of the trials and as to the working of the projectile. These projectiles are made cheaper than others of the same class.

For further information I would refer you to my brother, Mr. B. B. Hotchkiss, whose address is 21 Rue Royale, Paris, France.

Very respectfully, your obedient servant,

C. A. HOTCHKISS.

HOTCHKISS PATENT 8 INCH SHOT.



SEN. EX. DOC. No. 178 2nd 1st SESS., 47th CONG

WM. P. HUNT.

L. R., No. 174.] SOUTH BOSTON FOUNDRY,
Boston, July, 1881.

TO THE BOARD ON HEAVY ORDNANCE,
General GEORGE W. GETTY, *President, New York:*

GENTLEMEN: I have the honor to present certain views upon the construction of heavy ordnance, which, it is hoped, may meet with your favorable consideration, and, in connection therewith, submit several drawings, which represent, in the main, original constructions of cast iron without the auxiliary of steel or wrought iron, either as a lining or re-enforce.

In the presentation of these views I shall avail myself freely of the opinions and suggestions, both written and oral, of Army and Navy officers, and other professional persons; and the statements are submitted with the strong confidence in their soundness inspired by many years of practical experience in gun-founding with iron ores second to none in the world.

I am aware of a prevailing doubt as to the fitness of cast iron for heavy guns, yet submit, with deference, that as a material for *rifled* guns it has never been fairly tested; and, whatever the degree of popular misconception upon the subject, I believe that it can be shown to have been based upon unfair trials, resulting less from ignorance of the proper remedies than through the difficulty of supplying them.

The most casual reference to the firing records of former years cannot fail to discover the frequent recurrence of enormous strains caused by inferior powder and defective projectiles; and when it is borne in mind that the light cast-iron guns of ten and twenty years ago were subjected to strains calculated to vitiate in a single round all efforts at a proper estimate of their powers of endurance, the difficulty will be at once recognized of attempting to institute any true comparison of the strength or endurance of the guns of that period with the more modern structures, which have received only the fixed and uniform treatment due to the improved ammunition of a later day.

With the introduction of the Rodman large-grained powder (a boon to all nations and gunmakers) a great stride in gunnery was the immediate result, and very important difficulties disappeared; but there still remained to find a projectile which, while maintaining a proper efficiency in all other respects, would offer to the gun an absolute immunity from those occasional abnormal strains which no gun could be expected to long survive. It seemed almost as though further improvement in this direction was not to be looked for, and hence "the energies of military engineers were directed toward the construction of guns strong enough to bid defiance to the severe tests to which it was supposed that the least objectionable of the existing systems of projectiles and rifling must inevitably subject them."

The late General Rodman was among the earliest to appreciate the importance of this difficulty, as well as the narrowness of its bounds; and, after expressing himself similarly to the president of these works, stated, in effect, to a Congressional committee, in 1868, "that it was useless to attempt to arrive at a correct measure of a rifled gun's endurance

until a projectile was obtained which should be uniform and certain in its action."

The correctness of this opinion is well emphasized by the records of firing made up to 1871. The full records are doubtless available to the Board, but I have at hand a sufficient compendium of the results.* The amount of firing done at Fort Monroe between 1866 and 1871 was not very great, yet it was sufficient to yield the following striking comparisons. It will be observed that in this table two or more *consecutive* rounds have usually been selected for comparison. The table is very instructive, and exhibits forcibly the dangers to which our heavy rifles were at that time exposed. Here will be seen a projectile of moderate weight, fired with a moderate charge, the pressures and velocities for one or two rounds bearing something of a proper correlation; but suddenly, without any apparent reason, the same kind and weight of projectile, fired with the same charge and kind of powder, comes from the gun stripped of its sabot, or the latter jammed upon it, scored and abraded by the rifling, and actually leaves the gun with a reduced velocity, although the powder-pressure is enormously increased.

Table showing the irregularity of powder-pressures due to the bad action of rifle projectiles.

[From records of experimental and proof firing from various guns at Fort Monroe from 1866 to 1871.

Example	No. of round from gun.	Caliber.	Powder.		Projectile, weight.	Pressure.	Velocity.	Remarks.
			Kind.	Weight.				
		Inches.		*Pounds.*	*Pounds.*	*Pounds.*	*Feet.*	
1	1,046	8	Cannon	15	148	80,000	.....	
2	1,047	8	Cannon	15	148	150,000	.....	Gun burst. Shot stripped and marked by rifling.
3	747	8	Lens.....	15	150	100,000	1,254	Sabot wedged.
4	748	8	Lens.....	10	150	77,000	1,076	Do.
5	755	8	Lens.....	25	150	100,000	1,286	
6	756	8	Lens.....	22	150	31,000	Lost.	
7	215	8	Cannon	15	154	41,000	1,285	Good shot.
8	216	8	Cannon	15	150	41,000	Lost.	Do.
9	224	8	Cannon	14	148	100,000	1,092	Shot stripped "badly."
10	1	8	Cannon	15	149	64,000	Lost.	
11	2	8	Cannon	15	149	98,000	1,240	
12	3	8	Cannon	15	148	100,000	817	Gun burst. Projectile broke and wedged in bore.
13	12	10	Mammoth ..	25	292	73,000	1,284	
14	18	10	Mammoth ..	30	292	27,000	1,155	
15	1	10	Mammoth ..	40	300	36,000	1,128	
16	2	10	Mammoth ..	40	300	88,000	1,280	
17	25	12	Mammoth ..	55	420	23,000	.....	
18	30	12	Mammoth ..	55	531	88,000	.....	Gun burst. Shot stripped.
19	4	12	Mammoth ..	51½	646	32,000	1,088	
20	5	12	Mammoth ..	51½	603	34,000	Lost.	
21	6	12	Mammoth ..	70	683	200,000	924	
22	7	12	Mammoth ..	70	658	200,000	1,088	Shot stripped and deeply marked by the rifling.
23	8	12	Mammoth ..	70	609	150,000	1,007	
24	20	12	Mammoth ..	60	600	69,000	1,193	
25	27	12	Cake.....	71	600	98,000	641	Gun burst. Shot stripped and marked deeply by rifling.
26	1	12	Mammoth ..	64	624	240,000	.....	Shot stripped. Lost.
27	2	12	Mammoth ..	64	623	79,000	.....	

* Principally extracts from reports of Col. T. G. Baylor.

The foregoing table comprises but a few of many such results to be found in the records of the experimental practice of the time. Precisely the same irregularity of pressures, and want of concurrence between pressures and velocities, were at the time experienced by the English with their studded system of projectiles, and by Krupp with his lead-coated projectiles, even when using the prismatic powder. A detailed examination of this table may not prove tedious to the Board, and it is deemed important as serving to illustrate the enormous and uncertain strains to which our rifled guns were formerly subjected.

The first gun on the list appears to have given a most creditable endurance, but had to succumb at the 1,047th round to a powder-pressure of 150,000 pounds per square inch. There was nothing unusual in the character of either the shot or powder, and the weight of each was moderate; but the stripped and mutilated projectile (fortunately recovered) explains the mystery of this round and its fatal result.

In the next four examples soft metal seems to have been employed, and in two instances the sabot is described as forcing over windage with the resulting pressures varying from 31,000 to 100,000 pounds per square inch.

Examples 7, 8, and 9 are very instructive. We have here three consecutive rounds, in two of which the projectile happens to behave well, the pressures are reasonable, and the velocity good for the charge; but at the next round, with less weight of the same powder and projectile, the latter is described as "stripping badly," the pressure is *trebled*, and the velocity is diminished 200 feet.

In examples 10, 11, and 12 the same story of increased pressure and reduced velocity is repeated, and the projectile is described as having "wedged" in the gun.

Examples 13 and 14 also show the anomaly of the lesser charge, with the same weight of projectile, giving three times the pressure upon the surface of the bore.

Passing over similar inconsistencies in this table, we arrive at examples 19 to 25, and observe that in the fourth round, from a 12-inch rifle, a charge of 51½ pounds mammoth powder and a projectile of 646 pounds gave a pressure of 32,000 pounds per square inch, and a velocity of 1,088 feet. (The same pressure now yields us one-third more velocity.) There certainly seemed full justification for an increase of the charge to 70 pounds; but the result was the enormous pressure of 150,000 to 200,000 pounds per square inch, while the velocities were actually 10 per cent. less than when the pressure was but 32,000 pounds with the lighter charge. Nothing but the misconduct of the shot could produce this state of things, and, if further evidence were wanting, a glance at the stripped and mutilated projectiles would be sufficient.

The last two lines in the table, Nos. 26 and 27, are believed to be the only two rounds, up to date, ever fired from the 12-inch Rodman rifle at Fort Delaware, the only gun of its class (and 30,000 pounds to 50,000 pounds lighter than modern structures) now in the service. The projectiles were of good weight (the very light weight of the projectiles used at that time will be noted), but the charges were moderate, and, being doubtless of the best available mammoth powder, only moderate pressures should have been expected. One round shows a high pressure, without any remarks as to the performance of the projectile, but the other round shows it to have stripped, with a resulting pressure, said to have been carefully estimated on the testing-machine, of 240,000 pounds per square inch.

As to how these light guns could withstand so many of these great

pressures, it is believed that no gun could *sustain* such strains for a much longer time than barely sufficient to *develop* them, and it is just here that the high pressure caused by a faulty projectile is so much more serious than that produced by inferior powder alone. If the action of the projectile is uniform, safe, and reliable, it always escapes from the bore with facility, and by its unrestrained movement releases the gun quickly from the strains imposed upon it; but if the projectile wedges, strips, ballots, or jams in the bore, the powder-pressure is not only intensified, but *prolonged*, and thus the gun loses all the assistance which would otherwise be derived from the inertia of its own great mass.*

Passing from a consideration of the uncertain character of the treatment of our earlier rifled guns, it will be found that the absolute endurance of many of them, in the number of rounds fired, is very fine. Many smooth-bore guns can be referred to which have shown a wonderful power of resistance in this respect; nor is it any sufficient answer to this argument to say that, not being rifled, their resistance to internal or bursting strains is therefore no criterion as to the performance of a rifled gun; for, with a good system, it is thought that the rifling amounts to practically very little as a source of strain.

It has been said, and perhaps held by high authority, that while cast iron is abundantly strong for smooth-bore guns, yet that it requires to be lined with tubes of other material, such as wrought iron, to enable it to withstand the increased strains to which the rifled gun is subjected. I cannot shut my eyes to the conviction that this opinion is erroneous, and that the first part of the statement is irreconcilable with the conclusion. If the Rodman smooth-bore guns were considered strong enough for their established charges, then it is believed that a rifled gun of the same material should be considered equally safe, for the reason that, although for the same weight of gun the charge and projectile are heavier, yet the surface pressed is less, the pressure is lighter, the walls stronger (thicker), and there is no longer apparently any danger of abnormal strains. On the contrary, the improved rifle ammunition gives greater *uniformity* than formerly obtained with smooth-bore ammunition, while balloting, an undoubted source of injury, is also avoided.

This point may be illustrated by selecting a 10-inch smooth-bore gun, with its maximum charge of 26 pounds of cannon powder, as established some years ago, and with which it has been proved perfectly safe, and comparing it with an 8-inch rifle of the same exterior, fired with the adopted battering charge of 35 pounds of hexagonal powder, taking a mean of 600 rounds from a smooth-bore gun with solid shot and sabot, and an equal number of rounds from the 8-inch converted rifle.†

Gun.	Thickness of walls.	Powder.		Powder-pressure.		Strain endured 5 inches from axis of gun.	
		Kind.	Weight.	Per square inch.	Aggregate.	Per square inch.	Aggregate.
			Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
10-inch S. B.....	11-inch.	Cannon ...	26	45, 000	23, 000, 000	45, 000	23, 000, 000
8-inch rifle	12-inch.	Mammoth-	35	30, 000	17, 000, 000	19, 200	10, 880, 000

* Rodman's Metals for Cannon.

† No comparison of this kind can be absolute. We do not know, for instance, the relative distances to which the rifle and spherical shot move before the maximum pressure is reached, for, although the hexagonal grain is the slower burning, yet, on the other hand, the spherical shot moves easier; and each inch of movement counts for more surface exposed in the 10-inch than in the 8-inch bore.

Thus it appears that the rifle, although it has the thicker and stronger walls, is actually called upon to endure less than the smooth-bore gun. If, therefore, the smooth-bore be considered safe, the rifled gun of same exterior must be considered essentially so, and the increased strains to which the rifle was thought to be necessarily subjected are shown, with the introduction of improved ammunition, to no longer obtain.

Having thus shown that the statement that our cast-iron smooth-bores (with their larger bores, thinner walls, and stronger powder) are "safe and reliable weapons," is a practical admission of the reliability of rifled guns of the same material, I refer the Board with confidence to official records bearing testimony to the great endurance and resisting power of cast iron to internal strains as exemplified by the practical tests of many smooth-bore guns. None of these guns failed during the war, and the records of some are doubtless lost, but the following may be specifically referred to:

	Rounds.
A 10-inch cast-iron smooth-bore gun, No. 334, Pittsburg, endured	1,600
A 10-inch cast-iron smooth-bore gun, No. 362, Pittsburg, endured	2,450
A 10-inch cast-iron smooth-bore gun, No. 363, Pittsburg, endured	2,450
A 10-inch cast-iron smooth-bore gun, No. 1442, Boston, endured	1,400
A 10-inch cast-iron smooth-bore gun, No. 542, Reading, endured	650
A 15-inch cast-iron smooth-bore gun, No. —, Boston, endured about	400
A 15-inch cast-iron smooth-bore gun, No. —, Pittsburg, endured about	600
A 15-inch cast-iron smooth-bore gun, No. —, Pittsburg, endured about	600
A 15-inch cast-iron smooth-bore gun, No. 19, Reading, endured about	300

The charges in the 10-inch guns varied from 14 pounds to 35 pounds, and in some instances a number of solid shot were fired at once. The charges in the 15-inch guns varied from 60 pounds to 125 pounds, the great majority being 100 pounds, with solid shot and sabot of 460 pounds. Most of these guns, I believe, remain unbroken.

Turning our attention to rifled guns, it is found that only two 8-inch Rodman rifles (expanding system) were ever made; but these, very fortunately for the purpose of comparison, were of the same exterior model as the 10-inch smooth-bore guns, and, consequently, as our present converted rifles.

Of one of these guns I learn that, having successfully endured over a thousand rounds, including a number of very severe strains, it finally burst under a pressure of 150,000 pounds per square inch, caused by the stripping and wedging of a projectile.

The mate to this gun has been fired nearly nine hundred times, and is still apparently serviceable. It has been abused rather than proved with various experimental projectiles and powders, and has withstood enormous strains, over one hundred of these being as high as 75,000 pounds per square inch, and many more pressures running from that up to 150,000 pounds per square inch upon the surface of the bore.

The career of both of those guns was unfortunately closed before the era of improved projectiles, and in the very dawn, as it were, of improvements in powder, whereas the more recently constructed (converted) guns of the same caliber and exterior model have enjoyed to the fullest that immunity from vicious strains only to be secured by good and reliable ammunition. From the official records of these guns (the

only 8-inch guns of Rodman model and similarly rifled which have ever been tested) is extracted the following instructive summary:*

Gun.	Total number of rounds.	Number of rounds where the pressure per square inch exceeded—						Average pressure per square inch.
		30,000 pounds.	40,000 pounds.	50,000 pounds.	60,000 pounds.	75,000 pounds.	100,000 pounds.	
8-inch cast-iron No. 1	1,047	52	32	23	16	10	3	Out of 80 rounds.
8-inch cast-iron No. 2	864	780	462	225	184	115	16	46,000 pounds.
8-inch converted No. 5	590	56	9	4	None.	None.	None.	27,189 pounds.
8-inch converted No. 1	776	324	3	None.	None.	None.	None.	27,000 pounds.
8-inch converted B. L.	710	None.	None.	None.	None.	None.	None.	26,462 pounds.

The column of averages conveys, of course, but an imperfect idea of the resistance really offered by the cast-iron guns, since, in all probability, gun No. 2 was more severely taxed to withstand the sixteen pressures of 100,000 pounds per square inch and upward than it would have been had it been called upon to endure only the average pressure of 46,000 pounds throughout the entire 864 rounds. On the other hand, the uniformity of pressures in the converted guns is remarkable, only a few moderately high experimental powders being ventured upon after the guns had shown a satisfactory endurance with milder powder.

Passing to a consideration of larger rifles, there may be instanced a 12-inch Rodman rifle at Fort Monroe, the product of the South Boston Works, which endured successfully, before bursting, nearly 500 rounds, with various charges of experimental powders, and projectiles of 500 to 700 pounds, the gun receiving no fixed treatment. Numbers of the projectiles are reported to have "stripped," "wedged," or "upset," while many of the pressures exceeded 50,000, 70,000, and 90,000 pounds per square inch. The recovered projectiles frequently showed marks of violent action in the bore, and in many cases no records of pressures were taken. The only modern American weapon available for comparison with this gun is the 12.25-inch rifle at Sandy Hook, which weighs nearly two-thirds as much again, and which was completed at these works three years ago. I believe, however, it has only been fired thirty times up to date, with an average powder-pressure of about 24,000 pounds per square inch.

It is with no wish to underrate the strength of the converted guns, or of new cast-iron guns lined with tubes, that these comparisons are made; nevertheless I consider that every good record of endurance obtained from them is but an indorsement of their cast-iron casings, for I think it but fair to express the conviction that such satisfactory endurance is secured, not by *reason* of the linings, but rather in spite of them.

In considering the records of the Rodman guns, the fact should not be lost sight of that no cast-iron rifle has ever received a proper *fixed* treatment in proof, that is, proved by fixed charges of a standard powder and safe and reliable projectiles, but that different varieties of powder and inferior projectiles have been used, resulting frequently, as

* Reports of the Chief of Ordnance, containing reports by the Ordnance Board of experimental firing at Sandy Hook, reports of experimental firing at Fort Monroe by Colonel Baylor and others. I am also indebted to Colonel Laidley and Captain Butler for official data, publications, and information on these points.

has been shown, in strains that would be liable to burst the strongest guns. Nor should it be forgotten that these guns have all been remarkably light, the 12-inch rifle, for example, being from 30,000 pounds to 50,000 pounds lighter than modern guns of the same caliber, while the 8-inch rifles were from 25 per cent. to 50 per cent. lighter than guns of the same caliber abroad.

Touching this question, as to whether strength is added to a cast-iron gun by removing a portion of the interior and replacing with a wrought-iron tube, I am inclined to the opinion that the weight of evidence points to the contrary. Against the recent creditable proof of the converted guns may be balanced such facts and records as have been quoted; and against the recent unusual tests of double loading, applied by Sir William Palliser to a small gun, may be cited the extraordinary endurance of some of our 10-inch guns when filled with solid shot.*

The true test for any gun, however, is to prove it with *service* charges, observing a rigid adherence to adopted standards, or, where the results are intended to be comparative only, and the number of rounds may therefore with propriety be limited, it is imperative at least to eliminate all chance from the question by making the tests *uniform*, however severe they may be.

But even if the question of lined *versus* unlined guns is to be considered only as fairly balanced by the records quoted, unusual significance must attach to any intelligent experiments on the subject looking to a practical and definite solution of the question. I have understood that certain series of experiments inaugurated by Colonel Laidley on the United States Testing Machine point strongly (and without an exceptional result) to the conclusion that a cast-iron cylinder with a wrought-iron lining is *inferior*, in its power to resist bursting strains, to a simple cast-iron cylinder of the same bore and thickness. I understand that this conclusion has subsequently been verified by bursting lined and unlined cylinders with gunpowder, and, more recently still, by firing to extremity lined and unlined guns of more than one-third the size of the 10-inch converted rifles. And it is observed further, that these consistent results are in perfect accord with the experiments of General Rosset, of the Italian service, who, as the result of tests extending through a range of thirty different metals and combinations of steel, wrought-iron, cast-iron, and bronze, *found the proper place for wrought iron within cast iron to be at the foot of the entire list.*

All of these experiments, so consistent in their results, would seem to abundantly confirm the correctness of the opinion, that, if the lined 10-inch guns have fair resisting powers, the *unlined* gun of similar dimensions must be stronger still; while this again must be inferior to a gun of the same material, but modernized as to shape and dimensions. I am prepared to admit, of course, that a wrought-iron tube, of moderate thickness, is usually stronger than one of cast iron of the same dimen-

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* Much of the value of Sir William Palliser's experiment is lost through the element of *uncertai ty* which attaches to his test. It is true, his purpose was to prove that a gun need not necessarily burst because it is double loaded; in this he was successful; and he proved, what was to be expected also, that several such rounds *might* be fired without serious results, but that just the right combination of circumstances was *liable* to occur at any moment to produce the final catastrophe. When the pressure was taken, the gauge indicated from 90,000 pounds to 100,000 pounds, a strain which has many times been exceeded in our guns, although of much greater caliber. Experience has shown that some of these old cast-iron 42-pounders and 64-pounders possess great strength. It is thought that Sir William has been fortunate in falling upon a strong gun; and, while the test was undoubtedly severe, I see nothing in his experiment to indicate that a good cast-iron gun, of the same dimensions and without a lining, would not have sustained a similar test.

sions; yet if these be subject to repetitions of an internal strain of nine-tenths ultimate resistance, continued until just short of rupturing the cast iron, it may be found that the wrought-iron tube has expanded the more, for the reason that repeated or slow effects of such intensity will have greater effect, in changing its form, upon the coiled wrought-iron than upon the cast-iron tube.* Deficient as is the former also in transverse and longitudinal strength, and restrained, when used for guns, by its rigid envelope of cast iron, it is believed that it soon ceases to do its share of work; and while its modulus of rupture practically overlaps, so to speak, that of the surrounding cast iron, yet it acts more and more as a medium for the transmission of the strains of discharge, and less and less as an absorbent of them. Such being my views, I am gratified to know that they are also those of mechanical and military engineers, whose opinions upon most subjects I hold in high esteem; and I have ventured thus in the greater confidence to lay them before you.

It has been suggested that the cast-iron gun, when lined with a tube of softer material, would be less apt to burst explosively than if made entirely of cast iron; but this would appear to be a theory which is entirely refuted by facts. Instances can be mentioned where cast-iron guns have given clear indications of approaching rupture, and finally cracked apart; and, on the other hand, cases are cited of wrought-iron guns which have burst most disastrously, and this without including the recently double-loaded Woolwich and Palliser guns, which burst with extreme violence into many small fragments of wrought iron. Any gun is liable to burst explosively when subject to abnormal strains, such as are due to a wedged shot, double loading (if such a thing is possible in practice), and such like causes; but when a gun bursts during a *service* test, the character of the rupture will depend very much upon the condition in which the previous round left it. The last round may just part it and no more, or, with a surplus of energy, break it with violence into a number of pieces. Unless we can absolutely control this matter by building a gun which cannot be burst at all, or one which will give ample notice by an infallible and conspicuous sign, there is probably small choice between a gun which will bury its own detachment by a mild disruption, or scatter its fragments outside the fort. It is deemed far more practical to endeavor to construct a gun of known and definite endurance, that when its life is well spent it may be put aside, than seek that *ignis fatuus*, a gun which cannot burst, or, bursting, do so harmlessly.

It may be urged that no mention is made of the poorer records of our cast-iron guns, and that even some of the Rodman smooth-bore guns have been known to show unexpected weakness. I reply, 1st, that these few guns have been early experimental ventures; 2d, that whatever uncertainty or unreliability may exist in the present smooth-bore guns must certainly exist in practically the same degree when that gun is lined with a tube; and, 3d, when we have secured a handsome record of endurance from any gun, we have at once proved the possibilities of the system, and there remains but to explain the cause of the occasional failure. This determined, and the remedy found, we have at once established the desideratum of a safe and reliable plan of gun construction.

It is certainly not the part of wisdom to throw overboard a promising system, and one which has developed these great possibilities, until diligent effort has been made to eliminate whatever of uncertainty it

* This is, of course, a conspicuous fact with cylinders of equal *strength*. How far it applies to cylinders of equal *thickness* can be definitely determined by experiment alone.

may harbor. I think that I can make clear, not only the one weak spot in the Rodman plan of gun-casting, but the remedy also, which shall make every product of that system a perfect fellow of its predecessor, and a duplicate of a success. Yet, were not this improvement at hand, I should none the less urge strongly the fair trial of a Rodman gun, from the simple promise of the plan in its original form, and because it would merit, in my judgment, this confidence.

As a material destined to be so largely used in any plan of ordnance likely to be adopted in this country for a long time to come, and as a main reliance in guns now building, it would seem important to determine the exact value of cast iron as a principal component of such stuctures; and this can only be done by the trial of the cast iron itself, unaided by or uncombined with other metals. Thus fairly tested upon its own merits, if it should be found that our cast-iron guns do not need, or are perchance better off without an association with other materials, such fact would be of immense value. The question as it stands to-day is indeed one of national importance, and is a question which the nation should not be slow to definitely and exhaustively dispose of.

IMPROVEMENT IN GUN-CASTING.

MODIFICATION OF RODMAN'S PROCESS.—*Casting the gun breech uppermost, and prolonging the core-barrel entirely through the gun proper. Extending the muzzle to form a false bottom for the process of water-cooling.*

The superiority of the ores controlled by the South Boston Iron Company (with which corporation I have been officially connected for many years) and the intelligent treatment of its metals have, I believe, been generally recognized facts, while the great strength and endurance of some of their guns furnish significant proof, as has been stated, of the possibilities of cast-iron for heavy-gun construction. Nevertheless, the metal was inevitably subjected to more or less serious strains in the process of cooling, which undoubtedly tended toward neutralizing the excellence of the material. The Rodman process, and the principle of initial tension which it inaugurated, was a great stride in the art of gun-making, but was left incomplete by the force of time and circumstance. By prolonging the core-arbor entirely through the gun proper, yet still preserving the water-cooling (by prolonging the casting sufficiently to give a false bottom, which is afterwards cut off), the only source of injurious strains remaining in the hollow-casting process is removed, while an improvement in the quality of the metal itself is secured by casting the gun breech up.

In a Rodman gun the theories of internal cooling and initial tension have been carried out as far as possible; that is, for the length of the bore; but from the bottom of the bore to the base of the breech the circumstances of cooling and shrinkage are practically reversed; all the faults of solid casting here obtain, and this, too, at the thickest part of the gun, where such faults must necessarily be both greatest and gravest. The result is to set in operation certain cross-strains of a more or less injurious nature; and, as I desire to make this point perfectly clear, I shall, even at the risk of proving tedious to the board, enter into some detail both as to the cause of the evil and in explanation of the remedy which we are prepared to apply.

We may follow the process of cooling by considering the hollow part of this casting to be made up of a number of concentric cylinders of little thickness; the cylinder or layer of metal next the bore is first cooled and solidified, next the succeeding layer in cooling shrinks and binds

upon the first, and so on throughout the mass, the exterior of which it is desired shall be the last to acquire a set. But the breech or solid portion of the gun cools differently. With the exception of the metal in the immediate vicinity of the bottom of the bore (the breech of the gun being down), the exterior of the mass cools first, is first strained tangentially by shrinking upon the semi-fluid and greatly expanded metal of the interior, and then compressed by the shrinking of the latter. The inner layers in cooling adhere to the outer layers, and shrink away from the more yielding interior, resulting frequently in open or porous metal at the breech, in prolongation of the axis of the bore. To this fact may probably be ascribed the occurrence of those fine cracks which sometimes appear across the hard surface of the bottom of the bore, and which may ultimately lessen the endurance of the gun.

This defect, however, is probably much less serious than the operation of antagonistic shrinkage-strains near the thickest part of the gun, and the change in angle at the same place of the principal faces of the cooling crystals, which usually arrange themselves in a position normal to

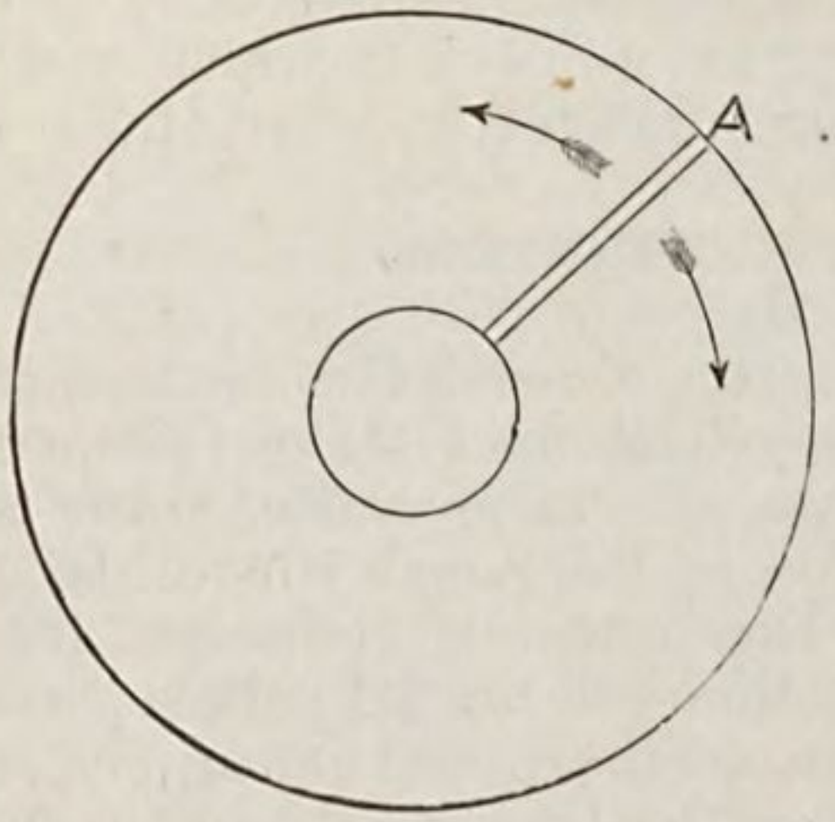


FIG. 1.

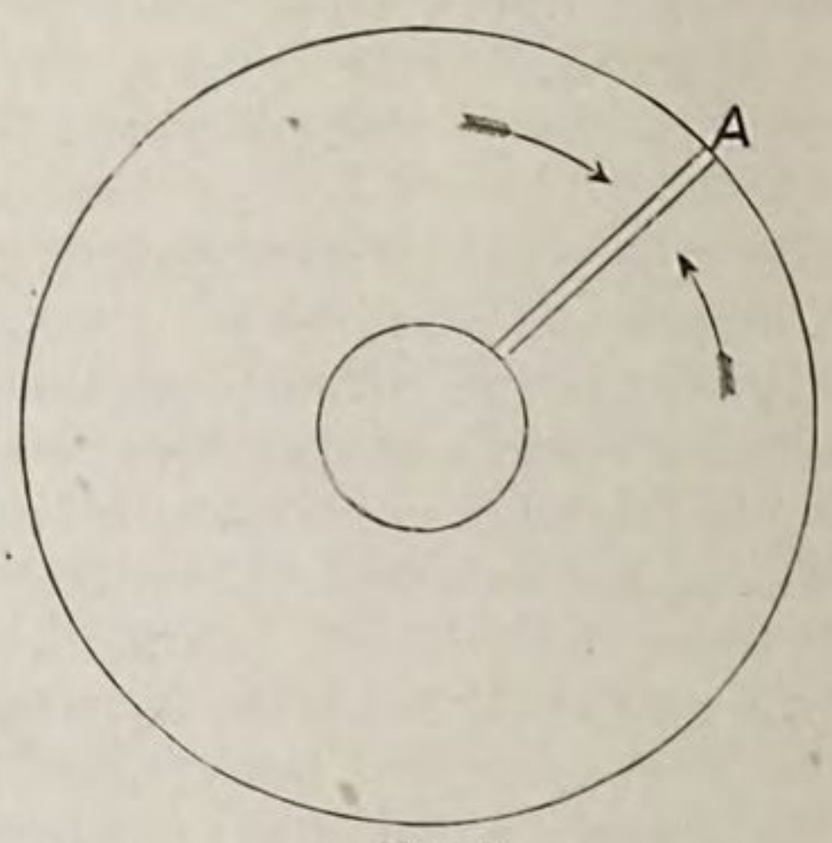


FIG. 2.

the direction of radiation. If a ring of metal, say a few inches thick, be cut from the gun at the bottom of the bore by planes perpendicular to the axis of the latter, and this ring be then cut across at A, as shown in the annexed Fig. 1, a reasonable initial tension, which would be about one-half of the ultimate strength of the metal, would cause it to spring open in the direction of the arrows, rupturing a considerable portion of the metal in this effort. Suppose a second disk (Fig. 2) to be now cut from the solid part of the gun, converted into a ring by boring it out, and then cut through as before at A; the tendency in this case will be found to close in rather than expand; and although this force has never been measured, the simple fact of its existence presents the spectacle of two great masses of metal, either contiguous or separated by very narrow neutral limits, strained powerfully in opposite directions; and, as this occurs at the bottom of the bore, the point of operation of a severe transverse strain whenever the gun is discharged, it cannot but be injurious in its effects.

It is believed that these conflicting strains may be entirely avoided by arranging the core-arbor to pass entirely through the body of the gun, allowing a projecting mass or pocket of metal (from the breech, if cast breech down, and beyond the muzzle, if cast muzzle down) sufficient only for the proper accommodation of the core-arbor, and thick enough to serve as a bottom for the bore in the subsequent operation of water-cooling. Thus will be eliminated, doubtless, the only element of uncertainty in the Rodman process.

As the bore will now extend entirely through the gun, it is necessary, of course, to close the breech with a screw-plug, except in certain forms of breech-loading. But, so far from this being an objection, it will probably prove to be an advantage. The otherwise inferior metal at the breech, in prolongation of the bore, is replaced by a superior material, and any desired distribution of the strains of discharge at this part may be effected by the character of the screw-thread employed. Whether the bearing-faces of the thread would be better square or inclined I am scarcely prepared to say; but experience with breech-loading guns and breech-inserted tubes, united with a consideration of the great strength of the breech, lead to the belief that with a well-proportioned thread it is not a matter of great importance whether the bearing-side be square or beveled.

There remains the question, whether the gun should be cast muzzle or breech uppermost; and upon this subject an experience of many years leaves no doubt in my mind. The best castings are always those with the large end up.* The impracticability of casting the Rodman guns in this manner* necessitated making the pattern cylindrical from the trunnions to the muzzle and the use of a very long riser, so that in finishing the guns to the prescribed taper much of the finest metal was removed, and that part of the gun in front of the trunnions was certainly not as strong as it would have been had it been practicable to cast it closer to the finished size. It is absolutely indispensable to a sound and perfect casting, especially with the stronger ores, that the reservoir of metal to supply shrinkage shall be of sufficient size to keep fluid for a reasonable time, and, if possible, be the last to cool; and no better adapted shape for a sound and homogeneous casting could be devised than a gun or a hollow truncated cone base up in the flask. It has been supposed that the weight of the body of the gun in cooling might improve the quality of the metal at the breech, and especially as to its density. This has been proved, as a rule, not to be the case; and the exceptions have only pointed to a slight uncertainty in this respect in the old plan of casting, which will probably disappear, together with the cross-strains before described, by the adoption of the modified plan, which can at any time be put into practice. The South Boston Iron Company cast both the Thompson 12-inch, and the 12.25-inch rifles, with the core-arbor extending almost through the gun proper, although both guns were cast breech downward; and, whatever the merits of these guns as completed structures, I have great confidence in the strength of the cast-iron walls. The 12-inch breech-loading 55-ton rifles now under contract are also to be cast in this manner. I think it desirable, however, in the fabrication of great guns, not only to cast the breech hollow, but to cast it uppermost in the pit, and there can be little doubt of the advantages of this method.

GUNS SUBMITTED.

A 12-INCH M. L. RIFLE OF 42 TONS.—*Cast hollow, with core-arbor prolonged, cooled with water throughout the entire bore and body of breech, cast breech up, and closed with a permanent breech-screw and gas-check.*

It cannot be questioned that a rifled gun of this caliber is indispensable as a fortification gun, and would prove a popular weapon with our artillerists. Its powerful fire would be felt with terrible effect upon the

*To cast a solid-breech gun, Rodman model, muzzle down, would leave no means of extracting the core-arbor, and, consequently, the water-cooling process would be impracticable.

heaviest iron-clads, and there are but few vessels which its heavy projectiles would not completely penetrate. The great power and accuracy of guns of this class have been well proved abroad, and it is thought that there can be no doubt of the ample strength of such a weapon. Two designs are presented—No. 1, a Rodman model, and No. 2, a modification of the same plan. For homogeneous structures I do not think that the general features of the Rodman model can be improved. The slight change in the form of the breech in gun 2 it is thought can be made with some advantage, as in a gun of this weight and size the flat cascabel and large neck will probably be found to no longer serve their original purpose, the former for the ratchet and the latter for suspending from gin or gunlift. The guns are 22 calibers in length of bore, almost as long as any of the experimental guns of large caliber abroad, much longer than most of the service guns, and ample for the combustion of any charge which there is any necessity for using or which can be profitably employed. The chamber is the maximum diameter which I should recommend, and is longer than necessary for a charge of 150 pounds. This gun ought to be considered a most useful and economical weapon if it should successfully endure 500 rounds with 100-pound charges and projectiles of 600 pounds (the same ratio of caliber and weight adopted for 8-inch and 9-inch rifles all over the world); but I believe it will endure handsomely with heavier charges and projectiles of 700 pounds.

The following are some of the principal dimensions and estimated data relating to these guns:

Total weight of guns	42 tons, or 94,000 pounds.
Preponderance	None, or as desired.
Total length of guns	295 inches, or 24½ calibers.
Length of bore, including chamber	264 inches, or 22 calibers.
Maximum diameter of gun	55 inches.
Diameter of muzzle	25 inches.
Diameter of chamber	13 inches.
Diameter of bore	12 inches.
Pitch of rifling at chamber	1 turn in 100 calibers.
Pitch of rifling at muzzle	1 turn in 50 calibers.
Number of grooves	21.
Width of grooves	0.89 inch.
Depth of grooves	0.09 inch.
Weight of projectile	700 pounds.
Weight of charge	150 pounds.
Conditional charge	200 pounds.
Estimated energy	16,000 foot-tons.
Maximum penetration in iron	23 inches.

Either of these 12-inch rifles could be furnished to the government for $25,000, and could be duplicated for a less sum.

A 12-INCH BREECH-LOADING RIFLE OF 45 TONS.—*Cast breech up in the pit, with core-arbor prolonged, cooled from the interior with water through the bore and breech, and fitted with a slotted breech-screw, operating in a steel sleeve, in order to secure an uninterrupted thread in the cast iron.* (Drawing D.)

I shall make no argument for the importance of arriving at a satisfactory solution of the breech-loading problem for heavy guns, and barely mention the success which seems to have attended the adoption of the screw fermeture in France, Italy, and England. There is no question but that it can be made to work well, and it is, withal, so perfectly adapted to cast-iron structures that it is here adopted unhesitatingly as the best system for this class of guns.

As the operation of the breech-screw requires one-half of both the

male and female threads to be cut away, it has been thought that the cast-iron threads might prove unequal to the strain. The success of the Italian experiment does not seem to have been checked by any failure of this kind, although perhaps the margin of safety is not what it should be, and this may be the weak part of the gun. It is desired to call the attention of the Board to a feature which will increase the security of the breech-block to such a degree that the only difference between the strength of the thread on the steel breech-block and that on the cast iron will be a difference entirely in favor of the cast iron. By referring to the drawing D it will be seen that the breech-block, instead of working directly within the cast-iron walls, is surrounded by a *steel sleeve*, which is secured permanently in the cast-iron breech by a *continuous* thread, and the interior of which has a slotted screw-thread to correspond with the plus thread upon the breech-block. Thus the relative aggregate lengths of the cast-iron thread and the steel thread of the breech-block are as about three to one, thereby putting the cast iron at least on a par with the best steel in its capacity to resist shearing from the longitudinal strain of discharge. The gun can never fail from this cause.

The South Boston Iron Company is now engaged upon four 12-inch breech-loading guns for the Army, for which it has been obliged to import the *unfinished* steel, at a cost of $48,000, the wrought-iron tubes costing some $4,000 more per gun. I earnestly suggest to the Board the importance of avoiding, if possible, for the future, an expense which my confidence in the plans which I have the honor to submit leads me to consider an unnecessary outlay. It is thought that the only two gun foundries in the country could be better employed for the interests of the government than the one in manufacturing wrought-iron tubes as gun linings, and the other in inserting, at considerable expense, these tubes into guns which are, in all probability, better off without them; while the large amount of capital and labor which is utterly lost to the country by the importation of heavy masses of steel warrants a serious effort to prevent. There are, indeed, persons of scientific attainment, whose opinions I hold in much esteem, who have expressed different views upon this subject; yet I feel it due to the strength and sincerity of my own convictions to express my views frankly to the Board, and, in the interests of the country no less than in the interests of private American enterprise, to suggest the application of the only crucial test of the question by the manufacture of a gun on plan D for comparative trial with the 12-inch guns now building. Such a trial would not only throw much light upon the vital question of gun-structure, but the two leading plans of breech-closing would also have a fair and thorough comparison.

If we deduct from the cost of the 12-inch B. L. guns now constructing ($46,000), the cost of the steel and the wrought-iron tubes, make a certain discount for plant, and then add the cost of the equivalent finished weight in cast iron, we shall have an approximate price of $30,000, for which sum I would be glad to undertake the construction of the 12-inch breech-loading rifle on sheet D.

This gun, it will be seen, consists of a homogeneous cast-iron structure, to which is applied the slotted breech-screw, with the modification already described.

The breech-block is extracted by means of a translating-screw of variable pitch, and is then swung to the right; the projectile, placed on a swinging tray on the left, is then swung to the right, and pushed, tray and all, into the gun; the tray stops at the entrance of the cham-

ber, and the movement of the projectile is continued until it is in proper position in the bore, after which the tray is extracted, the cartridge placed thereon, and inserted in a similar manner. The tray being then withdrawn and swung clear, the breech-block is swung back into position, shoved home by the translating-screw, and locked, by means of the multiplied gearing, by a one-sixth turn to the right.

The dimensions and other details do not differ materially from those of the muzzle-loading 12-inch guns previously described. They are as follows :

Total weight of the gun	100,000 pounds (45 tons).
Total length of gun	314 inches, or $26\frac{1}{6}$ calibers.
Length of bore (including chamber)	$24\frac{1}{3}$ calibers.
Maximum diameter of gun	55 inches.
Diameter of muzzle	24 inches.
Pitch of rifling at chamber	1 turn in 100 calibers.
Pitch of rifling at muzzle	1 turn in 50 calibers.
Number of grooves	25.
Width of grooves	0.753 inch.
Depth of grooves	0.09 inch.
Weight of projectile	700 pounds.
Weight of charge	150 pounds.
Conditional charge	225 pounds.
Energy at muzzle	17,000 foot-tons.
Penetration in iron	24 inches.

PROJECTILES, RIFLING, AND PROOF.

Should the propositions with regard to the construction of these guns meet with the approval of the Board, I should like it to be made a condition that they be proved with projectiles manufactured by the South Boston Iron Company, and I should elect to use the Butler projectile, as one which has presented a remarkable record of success, and which is deemed absolutely safe for guns of almost any caliber. The paramount necessity, in a test of such importanee as the trial of a system of heavy gun construction, of avoiding all risks of *accidental* strains induces me to lay great stress upon this point. These projectiles having been used for some years by the government without a single accident—the possibility of an accident being further removed each year—justifies the selection, while the owners would themselves vouch for the quality of the material to be employed in their manufacture.

In an unchambered gun the rifling is continued to within such a distance of the bottom of the bore as will insure to the expanding sabot a position over the grooves with the shortest cartridge which it is ever contemplated to use. But in muzzle-loading chambered guns, when less than the maximum length of cartridge is used, care must be taken that the projectile shall not be pushed into the chamber; that is, the projectile must occupy the same fixed position which is assured to it in the breech-loader. To accomplish this, recourse has usually been had to a stick or tube in the cartridge, or to lengthening the same by reducing its diameter. But these precautions are liable to be omitted through carelessness or accident; and therefore, in rifling the chambered muzzle-loading guns, it is proposed to provide a stop or check for the projectile in loading. This may be done by attaching to the sabot one or two studs or buttons, which require to be fed to the grooves in loading, and terminating the grooves at the desired point in the bore; but it would probably be a better plan to contract the bore slightly about an inch short of the chamber, at which point the rifling is terminated, and against which the sabot impinges when rammed home. This contraction

of the bore is not more than a few hundredths of an inch, and will not exceed one-tenth of an inch in a 12-inch gun.

With regard to the character of the pitch, it is preferred moderately increasing, because the work of rotating the projectile is thus distributed to better advantage along the bore; and it may also be found to contribute, more than does the uniform pitch, to the steadiness of the projectile in the gun and during flight. I believe that when tests have been made for accuracy alone the increasing pitch has been proved to have a slight advantage.

There are presented no guns of an intermediate caliber between the 12-inch and the 8-inch (converted) rifles, because it is probable that the satisfactory proof of a 12-inch gun would carry with it the assurance of the success of guns of less caliber. Nevertheless, the importance of a comprehensive trial would not only justify the expenditure—which, after all should be regarded as a trifle—but the information to be gained by the crucial proof of a whole *range* of calibers from 16 inches down would be of very great value and importance. These propositions, however, have been limited to the very *least* which it is thought the government should do towards the solution of the neglected but vastly important problem of the national defense.

Served with good projectiles, and with powders adapted to the varying calibers, as is the ordnance of the present time, I feel every confidence that the guns which I have the honor to propose would not disappoint the most liberal expectations formed of their effectiveness and endurance, and that, whether or not they fell short of the highest standard of excellence, the fruits of such an experiment would be cheaply purchased.

Respectfully submitted.

WM. P. HUNT,
President South Boston Iron Company.

L. R. No. 254.] OFFICE OF THE SOUTH BOSTON IRON CO.,
Boston, Mass., March 11, 1882.

THE BOARD ON HEAVY ORDNANCE,
GEN. G. W. GETTY, *President, New York, N. Y.:*

GENTLEMEN: Referring to the drawings which I had recently the honor to present to you in person, and which are additional to those forwarded with my first letter to the Board, I beg to submit the following explanatory remarks:

While reiterating in behalf of the company which I represent its faith in American cast iron as the best available material for the manufacture of heavy rifled guns, and urging no less earnestly that its fair and crucial test is a matter of even national importance, yet, as manufacturers, this company have on hand a number of alternative designs of more or less promise to meet the requirements of various theories, but the relative merits of which a practical test can alone determine. Some of these designs it has been thought proper to present for your inspection.

It is, of course, primarily the wish of the South Boston Iron Company to secure a thorough test of heavy cast-iron rifles (embodying the improvements already described) under the favorable conditions enjoyed by rifled guns since the introduction of improved powder, projectiles, and rifling; but I shall not repeat the various arguments under this

head, except so far as to say that, setting aside our own great confidence, even a very moderate promise of success would seem to justify a full and comprehensive test of a question which must prove so great a boon if settled affirmatively, and must even remain a bar to progress while it remains in doubt.

There are those who claim that while cast iron is abundantly strong as a material for large guns, yet that the surface of the bore in the position of the powder-charge requires to be protected from the searching action of the gases. Our experience does not, I think, bear out this belief, and I have already expressed myself on this point. Those who make the objection, however, have themselves met it by suggesting a thin lining for the chamber; and designs G and H illustrate this idea, the one having a thin lining of *copper*, perhaps one-fourth to one-half inch thick, and the other an inside sheathing of *steel*, one inch thick. These thin tubes would be renewable at pleasure, although special means might have to be provided for their extraction should it be found necessary to renew them, a matter of some doubt.

There are others who claim that cast iron requires to be *strengthened* by the judicious application of other materials, and generally it is agreed that *steel* is the best strengthener. But opinion is divided as to whether it is more advantageous on the exterior or interior of the casting.

Design D has already been brought to your notice. I believe there is much at stake in the proof of such a gun, and that its promise is very great, but will not repeat the arguments in this direction. We place it first in importance in our heavy-gun designs (unless it be the muzzle-loaders, believing that the question of endurance is of primary, and that of breech-loading of secondary, importance in the present condition of heavy-gun construction).

Design E represents our plan for lining a gun on the interior with steel, and I believe that it possesses important advantages over the French and Spanish plans of having the tube and breech-receiver in one piece; for by the latter plan no particular strength is added, and the satisfactory insertion of the tube is made much more difficult. The gun should be slightly heated before the French tube is screwed in, and is consequently expanded more longitudinally than circumferentially, so that a tight joint at the shoulder near the surface of the bore can only be secured by chance. Again, when the gun is discharged the tube has a tendency to be set backwards, thus opening the joint, while if the tube is held tightly together between the screw-threads at the breech and the shoulder at the small end its heating by successive discharges brings a longitudinal strain upon the surrounding cast iron entirely auxiliary to that due to the pressure of the powder gases upon the bottom of the bore. By separating the tube proper from that portion which surrounds the breech-block its insertion is simplified, its tension easily regulated, the joint in the bore will always be kept tight by the forward pressure of the gas within the gas-check recess, room is given for any expansion due to the heat of discharge, while the "back-set" of the breech-block receiver does not effect the position of the tube or subject it to any longitudinal strain in the neighborhood of the gas-check. The tube is also lighter, is without heavy shoulders, and better forgings can be made. The small band at the front shoulder of the tube provides a curved junction of full radius in both the tube and the body of the gun.

Design F is like E, of similar outline to D, but is reinforced on the exterior with steel, a modification of the Italian plan or of the French plan, with the tube omitted. By allowing the trunnions to make part of the original casting, the construction of the gun is much simplified and cheapened.

Design I, still preserving the contour and general dimensions of the preceding guns, is a modification of the French plan of placing steel both on the exterior and interior of the casting. It is a union of the two designs E and F, and is thought to be a simpler and a better plan than that of the French, having the exterior re-enforce extended beyond the trunnions, which cannot be economically attached, while the interior tube possesses the advantages already described over the French and Spanish plans.

Although the construction and proof of this gun would be of interest, yet it would leave unsettled the important point as to whether the exterior or interior application of steel in guns of this size is the more advantageous, and also whether the combination of steel with a cast-iron gun of large caliber is useful or even necessary, and, if of use, the *degree* of this advantage. It would seem as though these important questions could *only* be determined by the proof of the three guns D, E, and F, made of the same materials and tested alike.

An estimate of the cost of construction and proof of design D has already been presented to the Board. Gun E would cost about $3,000 additional, and gun F about $1,000 additional. These estimates are for a single gun, and include the tools and fixtures not now available, and the preliminary trial-heats and tests of metal. Should plan D, with additional guns, be ordered, the estimate would undergo modification. Should the three designs D, E, and F be desired, they could be delivered at our works complete for $25,000, $28,000, and $37,000, respectively. We should import the best available steel from foreign makers of established reputation. The aggregate cost of the three guns would thus be $90,000, much less than has been expended upon many single guns abroad, and no more than for several experimental efforts in this country, yet not unwisely, perhaps, since the most liberal outlay in this direction may be a small price to pay for the information afforded even by a failure.

The cost of proving these three guns up to 500 rounds each may be calculated on the basis of our former estimate for design D, and if the projectiles and powder be procured by exchange of old material, as authorized by law, and the former be retained for service after one firing, the cost would not be great. It would probably suffice to double our original estimate for the transportation, proof-butt, and labor for these three guns. If not more than one experimental carriage was desired, the guns could be mounted on a strong structure, surmounting timber slides.

I do not know whether the consideration of guns of moderate calibers is within the purview of your Board, but deem it proper to present plans of steel breech-loading guns of 6-inch, 8 inch, and 10-inch caliber, which are the sizes contemplated for the vessels designed by the Naval Advisory Board, and which were laid before the House Committee on Naval Affairs, the question of heavier guns for vessels of different type being for the present left in abeyance.

I have no hesitation in stating my belief that it will be many years before we shall be able to procure reliable steel in this country suitable for even guns of these calibers. We should build the guns of the best steel procurable from foreign makers. If they proved successful and the demand for such guns found suitable recognition by Congress, we could in time become independent of Europe. A single 60 or 70 ton hammer would, however, cost us upwards of a million of dollars, and its production would of course be limited.

The designs are believed by our mechanical engineers and others

who have seen them to be admirably adapted to securing the maximum effects from a good material, the component parts of the structures being of such form as to be most readily forged for the given mass, and within the capacity of several European works to produce.

Design A represents a 6-inch and an 8-inch gun, in which the gun tube is relieved from all longitudinal strain, except that which is due to its own inertia, the balance of this strain being taken up by the enveloping jacket or "B" tube, which, being locked firmly into the trunnion-ring, absorbs all longitudinal strain due to its own weight and that of the circumscribing re-enforce bands, the trunnions, and the gun-carriage. Instead of depending upon locking-rings to hold the gun together longitudinally, with no deeper shoulders than can be allowed by shrinkage (usually not exceeding 0.03 of an inch in depth, with more or less uncertainty in properly locating them), the shoulders in these guns have all good bearing-faces, with ample room for well-rounded corners. The jacket, trunnion-band, and re-enforce bands are all dropped over the breech of the gun-tube at a very moderate heat (resting upon their respective shoulders while cooling), and a tension secured to at least a diametrical difference of about 0.0001; that is, the .0001 per inch of diameter of the shrinkage surface as a minimum, which with ordinary steel will provide an initial tension very much within the elastic limit of the material. The breech mechanism is the slotted screw, of which we should adopt that particular form which the large experience with that system has now brought to apparently the greatest perfection.

Design B represents a 10-inch steel breech-loader, entirely similar to design A in structure, except that owing to the greater weight and length of the piece it has been thought proper to apply an extension re-enforce some distance beyond the trunnions. This part is simply and economically applied.

Design C is also similar in principle to A, but a curved contour has been given to the gun both in the chase and in the rear of the trunnions. The gun is only a trifle lighter than the others, and the finish is a matter of taste only.

Design K differs from A only in having the trunnions and trunnion-band of strong cast iron. This I have little doubt will be found to answer the purpose fully as well as the troublesome and expensive steel forging, while, if sound and unstrained (always more or less of a question in steel forgings), possesses a surplus of strength for this part of the gun.

Design L represents an 8-inch steel gun, so constructed that the gun or "A" tube is relieved of *all* longitudinal strain, which is absorbed entirely by the surrounding jacket or "B" tube. This increases the transverse resistance of the interior tube and lessens that of the jacket; but the latter is *stiffened* against "deflection" or bulging, due to transverse strain, and while robbed of a quantity which it does not need in so high a degree as the inner tube, has a merit added to it of some practical benefit. The same effect obtains only in a lesser degree in the other plans.

Design J is a 6-inch B. L. rifle of bronze, re-enforced by steel, and condensed by a process invented by Mr. Dean, of our works, and which has proved a great success abroad as a substitute for steel, of which more or less distrust has always been felt, and the supply of which in well-forged masses has been inconveniently limited. I think there is no doubt of our being able to furnish a special grade of bronze which shall possess a uniform strength of 40,000 to 50,000 pounds per square inch (most likely the latter figure will be attained), with a considerable increase of strength in the neighborhood of the bore, where the condensa-

tion of the material will be of the greatest benefit. I should have great confidence in the power and endurance of such a weapon, which can be constructed for less money than a steel gun of similar weight, which for the present would cost, by Krupp's schedule, $1 per pound, this being Krupp's regular price for his guns, based upon an enormous plant, the production of his own steel, low wages, and large orders. We could scarcely expect to furnish the foregoing steel guns for less than $1 per pound; we would undertake them, however, at that price upon a guarantee from the government against loss, all mechanical risks being our own.

All of the foregoing designs are breech-loaders. Our designs for muzzle-loading guns are already before the Board. Frankly, I am of opinion that the question of breech-loading has been overestimated. The breech-loader is by no means a necessity, although on shipboard and in casemates it is an undoubted convenience. Were breech-loaders an absolute necessity, it would mean that if we cannot have breech-loaders we ought not to have any guns at all. Such an uncompromising policy would certainly be unwise. England is supposed to be formidable upon the seas; yet there is scarcely a breech-loader in her navy, and it will be many years before the muzzle-loaders can be replaced. As long as heavy guns *en barbette* shall remain a feature of coast defense it would seem as though the heavy muzzle-loading rifle could practically hold its own in point of convenience in handling, rapidity of fire, and protection to men, while in all other respects it must enjoy a great advantage. Cheaper, therefore more of them; simpler, and never out of order, and requiring no care where the breech-loader may become disabled by a trifling accident, and must be kept perfectly clean in positions where there is a maximum of rust and neglect and a minimum of attention—exposed sea fronts. The advantage of testing a breech-loader is, of course, that its success would carry with it the positive assurance of the success of muzzle-loaders of like general construction; but, on the other hand, the breech loader might fail from some cause connected with the breech mechanism and leave unsolved the problem of a most efficient class of guns and a useful recourse. It is from this view that I dwelt with some particularity in my former communication upon the importance of testing muzzle-loaders in connection with any form of breech-loaders which might be deemed proper in the judgment of your Board to test. Nevertheless, I feel the strongest confidence in the entire success of the heavy breech-loading rifles which I have had the honor to present.

With regard to the chambering of these guns, it is thought that the chambers are full large. The subject has scarcely passed beyond the range of pure experiment before it is found that as good results may be obtained with chambers of ordinary depth as with larger ones. It is mainly a question of *ammunition*, after all, both as regards quality and quantity. Air-spacing has already been defeated at Woolwich by compact charges. The only question which our foreign gun-makers leave unsolved is the *endurance* of their guns, called "high power" (the gun is no different), from the result of a few abnormal charges.

Touching the *weight* of the guns presented by our works, it is possible that they might safely be somewhat reduced, but it is thought unwise to do so until their strength in their present dimensions has been amply proved. The tendency has not been to reduce the weight of guns except through the reduction of their calibers, it being to the obvious advantage of gun-builders to produce small guns and trust to the improvements in ammunition not to overstrain them, rather than cumber

their shops with heavy structures, of slow production, of enormous cost, so that few nations can afford to buy them, and of somewhat doubtful quality when completed. If governments will be contented to sacrifice the enormous advantages of heavy calibers, it is clear gain to the manufacturers, who find all their profits in a more rapid production of lighter calibers.

The guns which we have presented are heavier than some and lighter than other European structures. We deem it unwise to attempt to build a *lighter* gun than one of the same caliber by experienced makers abroad, but the following table will show that none of our guns can be called heavy in comparison with the more recent structures. In this comparison nearly all the guns are of great length; they would appear "lighter," yet be as strong, if brought back to the old standard of 15 to 18 calibers in length of bore:

Description of gun.	Caliber.	Weight of gun.	Length of bore.	Weight of shot.	Ratio of shot to gun.
	Inches.	*Tons.*	*Calibers.*	*Pounds.*	
Woolwich muzzle-loading	16	80	18	1,700	105
Woolwich breech-loading	12	42	26	700	134
Armstrong muzzle-loading	17.72	100	20	2,000	112
Do	11	35	22	525	149
Do	8	11.5	26	182	142
Do	6	3.9	23	70	125
Krupp breech-loading	12	38	22	{733 / 666}	121
Do	12	36	19	666	121
Do	9.45	17.7	22	310	128
Do	5.87	3.8	25	70	124
French breech-loading	18.11	124	21	2,240	124
Italian breech-loading	18.10	87	18	2,240	87
United States (late breech-loading)	12	55	25	700	176
South Boston Iron Company cast-iron muzzle-loading	16	100	22	1,600	140
Do	12	42	21	700	134
South Boston Iron Company cast-iron breech-loading	12	45	25	700	143
South Boston Iron Company steel breech-loading	10	22	26	400	123
Do	8	10.5	26	190	124
Do	6	4.2	26	75	125
South Boston Iron Company bronze breech-loading	6	4.6	26	75	135

Thus it appears that our proposed guns are practically no heavier than equivalent calibers abroad, and even if a moderate increase in weight were found necessary to produce a power equal to that of guns double and treble their cost (I speak now of cast-iron guns), so slight a disadvantage would surely be compensated for by the many advantages which were presented in my former letter.

A noteworthy exception in the foregoing list is the Italian gun of 87 tons, which, if increased in length to 22 calibers, would still be lighter than its built-up rivals. No efforts appear to have been made to get extraordinary velocities from this gun for the purposes of advertisement, yet its record of 1,500 feet velocity for over one hundred consecutive fires stands practically unrivaled. This gun has been jealously regarded by certain gun-builders, who have found criticism very difficult so long as their own records are of so meager an extent. For the purposes of our own comparison, it is true that this gun is not entirely of cast iron, but it is mainly so, and of a strength at least 20 per cent. less than we should expect to obtain with our American iron. It is actually lighter than some of its built-up rivals, and we do not know, and never shall know without a practical test, how much, if any, assistance it may derive from its system of steel re-enforcing over an equivalent vol-

ume of cast iron of an uniform tensile strength of 30,000 pounds per square inch.

I have understood that the Fortification Board has expressed the opinion that our coast defenses require a number of 100-ton guns. It may be considered premature by your Board to recommend the immediate construction of a gun of 16 or 18 inches caliber, yet should a satisfactory endurance be obtained from any of the 12-inch designs which have been presented, I think the construction of a colossal gun of similar design could be safely undertaken; or, if more than one of these 12-inch guns should be tested with success, the way would be prepared for the construction of a 100-ton gun on the plan which proved most successful in the smaller caliber.

Very respectfully, your obedient servant,

WM. P. HUNT,
President South Boston Iron Company.

L. R. No. 274.] OFFICE OF THE SOUTH BOSTON IRON COMPANY,
Boston, Mass., April 15, 1882.

To THE BOARD ON HEAVY ORDNANCE,
General George W. Getty, President, *New York, N. Y.:*

GENTLEMEN: Referring to our conversation a few days ago, in which I stated that in any of the gun designs of this company in which steel entered as a component part of the structure it would be imperatively necessary to import that material, I omitted at the time to except *steel wire*, because we had no designs before the Board in which steel in this form was employed.

Upon the assumption that steel is a practical strengthener of heavy cast-iron guns, also upon the assumption that its exterior application in such cases is more efficient than its use on the interior (two important questions which only a practical test can ever determine), it is possible that steel wire may be the most advantageous form to adopt. Upon this point I express no opinion; but as, owing to the admitted difficulties and uncertainties of steel forgings, the subject of wire-wrapped guns is now receiving attention in several quarters, I submit plans in which it is thought that the wire is applied in, possibly, the most practical form.

Design M represents a 12-inch cast-iron breech-loading rifle, with exterior re-enforce of wire, round or square, in cross-section; and design N represents a muzzle-loading gun, in which the wire used is of riband form. In each case the wire is wound in the form of a simple cylinder, and brazed after the plan of W. E. Woodbridge. After brazing, the cylinders would be finished to correct dimensions and dropped over the breech of the gun at any desired heat and tension. The temperature employed for this purpose would of course be very much less than that found necessary for brazing the wire, and the latter operation, owing to the comparatively small mass and thickness of the cylinders, could doubtless be conveniently and well performed.

In any system built up of wire it is of course indispensable to use a central tube, and if the wire can be so arranged as to offer sufficient longitudinal resistance to discharge, the thickness of this tube may be proportionally reduced.

Designs O and P, herewith submitted, represent what we consider a practical form of wire construction, which may be found worthy of consideration. The central tube is of steel, and the first re-enforce is

wound of H-shaped wire, which, after brazing, should give considerable longitudinal strength. This cylinder is shrunk upon the tube, and an exterior cylinder, formed of steel riband, also united by brazing, is shrunk upon the first cylinder after the trunnion-band has been applied. The edges of the H wire would be slightly rounded, which might facilitate its manufacture, and also the process of brazing. This form of wire was, we believe, originally suggested by Rodman, who early gave some thought to the subject of wire guns (though perhaps only as an illustration of the principle of initial tension), but abandoned it under conviction that the process of hollow casting and interior cooling of a homogeneous metal would prove the more practical and certain method of attaining those theoretical effects which it is supposed by its advocates that wire-wrapping may secure.

The H wire would, of course, have to be wound in one direction only, that is, the spirals could not cross, and each spiral would have to be fastened independently at the extremities. Should difficulty be encountered in manufacturing this form of wire, a somewhat similar effect could be produced by a waved or grooved riband, or even plain round wire, brazed, of course, and wound in one direction only, so as not to cross.

We have designs of condensed bronze guns wound with wire, but do not submit them, as any experiment of this kind should be restricted to comparatively moderate calibers; the steel reinforce on design J, for example, could be of drawn wire instead of forged steel.

I take this opportunity to state, although it has probably suggested itself, that while our different designs have in each case been adapted especially to the calibers presented, there is nothing, in most cases, to prevent the adoption of the same plans in guns of various calibers. Referring, for example, to our 16-inch and 12-inch designs: In the former the gun is cast cylindrical, that is, without trunnions, and the re-enforce bands extend under and forward of the trunnion band, while in the latter (Design F) the trunnions are cast with the gun, and the steel is confined entirely to the rear of the rim bases. This last plan is somewhat simpler and cheaper, and makes a graceful and we think equally efficient gun; but the two plans are, of course, elective for any caliber, and while Design F_2 represents the application of the first plan to a 12-inch gun, it is considered unnecessary to duplicate design F in any other caliber. In connection with this idea it only remains to say that if, in the judgment of the Board, it should be thought important to test the three 12-inch guns D, E, and F, recommended in my previous communication, objection might be made to Design F, as not fairly representative of the Italian plan, which has the trunnions separately applied. Should this objection be thought reasonable, although both of the other guns would have the trunnions and gun all in one, there would be no difficulty in following plan F_2, and I neglected to state that we would undertake to do so without extra cost. I may say that I consider both the designs F and F_2 to possess advantages over the Italian plan.

The addition of an interior tube in Designs F and F_2 gives us the modifications of the French plan shown in Designs I and I_2.

Reverting to the subject of steel guns, the several designs which we have submitted have been very carefully considered, and are believed to combine all the best features of such structures; and it has been specially sought to avoid the objectionable plan of depending upon "locking rings" and shrinkage shoulders alone for the longitudinal strength of the system. But we have proposed no steel gun of greater caliber than 10 inches, and I am frankly of the opinion that a long time

must elapse before we should be able to procure for guns of this caliber anything like a reliable quality of material in our own country, and should expect to find some difficulty even abroad. Therefore, should our designs meet the approval of the Board, I would venture to suggest the propriety of commencing with a gun not larger than 8 inches caliber. The procurement of a satisfactory quality of steel for a gun of this size would present much less difficulty than for one of larger bore, while the successful production and proof of a gun of such size would be a matter of fair congratulation, and we should be able to pass to larger calibers with increased confidence. An 8-inch steel breech-loading rifle, if successful, would be representative of a really powerful and efficient class of ordnance, both for ships and forts, and I believe I have heard it said that the engineers desire such guns for some established casemates.

In speaking of the *success* of such a gun, I of course mean with high charges; otherwise, there occurs to my mind no reason for constructing it. I have no doubt whatever of the ability of an 8-inch cast-iron gun, whether breech-loader or muzzle-loader, to stand the usual battering charges of 35 pounds of powder behind projectiles of 180 to 190 pounds for any reasonable number of fires, thus giving us as formidable a weapon for the caliber as practically exists to-day in any service, and at one-fourth the cost of a steel gun. But if more than this is desired, if it is desired to procure increased penetrative power by increase of *charge* instead of increase of *caliber*, we must probably resort to steel, and endeavor, first, to get it reliable, and, next, to combine it in an intelligent structure. I think that the effort should be made, and although the problem of the built-up gun is far from solved, yet the knowledge and experience gained by the construction and proof of the proposed weapon would be of great value in shaping our course for the construction of a larger caliber.

The steel guns which we have presented, besides being adapted to the present facilities of our works, are regarded as of superior design. We are opposed to the shrinking of bands directly over the central tube, or to any joint next to the gun-tube and near the powder-chamber, unless the tube be very thick, since the structure is thereby robbed of transverse strength. Krupp aims to make his tubes thick, partly on this account, but we should not probably be able to procure such tubes from him, and it is thought the better plan to assemble the guns as described in my previous communication.

Therefore, should we be authorized to construct an 8-inch steel gun, we would elect Design A, or perhaps, preferably, B, which extends the re-enforce further in front of the trunnions; but should a 10-inch gun be demanded, it might be found desirable, owing to the greater size of the parts, to adopt the Design B_2, instead of B. The labor on Design B_2 would of course be increased, but this would probably be compensated for by increased reliability of material.

The mechanical construction of this design should perhaps be described somewhat in detail. The central tube A is first rough-bored and finished accurately on the exterior. The second tube or jacket B is then finish-bored and dropped over the breech end of the tube, being of a diameter and temperature previously determined as sufficient to produce a desirable tension. The tube C, being finish-bored, is then dropped over the muzzle end of the central tube and allowed to shrink upon it, abutting against the jacket B and the quarter-inch offset *p*, which is faced even with the end of B when that part is cold. Next, the exteriors of B and C are turned, and the tubes D and E, bored to correct diameters, are dropped over the muzzle and rest on the shoulder *t*

while cooling. The shouldered portions of all the tubes are cooled more rapidly than the other ends. When the gun is cold the exteriors of tubes D and E are finished, a 0.25-inch shoulder, *r*, being allowed on D, and a 0.35-inch shoulder, *s*, on E; the finished trunnion band would then be heated to about 500° F. and passed over the breech of the gun, resting snugly against the shoulder *r* until it had shrunk down upon the shoulder *s*. The breech collar *u* may next be applied, and the collar *w*, if thought desirable; and, finally, the exterior bands are dropped successively into place and cooled. There is not a single "locking ring" in this construction, and but one shrinkage shoulder, the comparatively unimportant one at *s*.

In the accompanying designs of wire-wrapped guns it is proposed to construct only a series of wire re-enforces, so to speak, and then build up the complete structure, thereby avoiding the high heating of the entire gun for the purpose of brazing. While it is thought that these plans might be found to overcome some of the objections to wire structures, yet the subject is too purely experimental for us to express a definite opinion upon the merits of the particular plans presented. We also find it difficult to arrive at anything like a correct estimate of the cost of such guns. It is presumed that the wire re-enforces could ultimately be produced at less cost than cylinders, and possibly bands, of forged steel; but for experimental structures the cost would probably be greater. Should we ever undertake the structure of one of these guns, we would prefer to do so, as at present advised, under a contract based upon material, labor, and the use of plant at a fair valuation. We give it as our opinion, however, that the 12-inch rifle M and N of 45 tons would cost for a first gun about $50,000. If the gun were cast without trunnions, and the re-enforce confined to the rear of the rim bases, or if the wire extends to the front of the trunnions, giving the same contour as Design F_2 or I_2, the cost would not be materially changed. The 10-inch 20-ton wire-wrapped gun, with a central steel core, would probably cost $45,000.

In all of our designs it is of course understood that the experimental construction constitutes no criterion of the cost of additional guns of the same pattern.

Very respectfully, your obedient servant,

WM. P. HUNT, *President.*

L. R. No. 261.] OFFICE OF THE SOUTH BOSTON IRON COMPANY,
Boston, Mass., March 31, 1882.

To the BOARD ON HEAVY ORDNANCE AND PROJECTILES,
General George W. Getty, President, *New York, N. Y.:*

GENTLEMEN: I have deemed it proper to lay before you a portfolio of projectiles such as the South Boston Iron Company have supplied to the government for some years past for both muzzle-loading and breech-loading guns, the proportions and dimensions of which are thought to be those which constitute a proper standard for service, based upon the requirements and practice of our own and other countries.

As the Butler projectile, after so many years of successful use, can scarcely be said to occupy the doubtful status of an experimental one, its consideration may not be thought to come within the scope of the Board's action; and, indeed, as this projectile constitutes a natural standard of comparison for any others which may be thought worth testing, a request for any specific trial of it would appear superfluous.

But I am aware that in the warm advocacy of other designs their promoters have assailed this projectile, and as I have made it a point to strongly urge upon your Board the expediency of using it, and no other, in certain guns which have been submitted for your consideration, it is thought right to call your attention to some of the reasons for the expressed confidence in these projectiles.

For the first, it has been claimed by the advocate of a ribbed system of rifling, which I believe is before your Board, that the Butler projectile unduly strains the gun by "wedging." In this statement I think the gentleman has been unfortunate in selecting a feature which, however common to some projectiles, is not only conspicuous by its absence, but is also a mechanical impossibility in the form of sabots which we have adopted for our rifle-shot. Another gentleman has stated—though perhaps not to your Board—that the recent failure of three breech-loading rifles at Sandy Hook was easily accounted for, "as the Butler projectile had burst them." I believe that not a single expanding projectile was fired from these guns, and as they are the *only* guns at Sandy Hook which were *not* proved with our projectiles, I am spared the necessity of any argument in this direction.

From the time, ten years ago, when this projectile was first tried, up to the present moment, the government has had in it a faithful and *reliable* servant. Long previous to this there had been very great improvement in gunpowder, but this did not prevent other systems of projectiles proving at times most treacherous and dangerous agents. But during the last ten years, alike in service and through varying circumstances of experimental practice, our projectiles have proved perfectly reliable. Other projectiles, by dint of numerous trials and a careful adaptation to a particular caliber and a specific charge, may have occasionally equaled, or even, by some accident, exceeded in a trifling measure our projectiles in some single feature, such as accuracy; but in all those many important qualifications which go to make up a perfectly reliable rifle-projectile the government has found this shot was invariably to be depended upon, and I have no hesitation in pronouncing its record as a muzzle-loading projectile entirely without a parallel.

It is scarcely necessary to describe in great detail the operation of the sabot. The gases of discharge entering the annular groove, there is almost immediately established an equilibrium of pressure which evenly expands the upper lip into the rifling. With slow-burning powder this expansion does not occur until after the shot is in motion and its inertia has been overcome; at the same time the gases press upon the lower lip or flange of the sabot, causing it to hug the iron base of the projectile tightly, thus rendering the fatal objection of stripping a sheer impossibility.

I beg to enumerate, briefly, some of the numerous advantages of our projectiles, as follows:

1. The sabot insures unfailing and admirable accuracy in all projectiles of good form adapted to the pitch of the rifling.

2. A full and perfect rotation of the projectile, due to the pitch of the rifling, is invariably secured, as proved by a record of several thousand rounds from various calibers.

3. It is simply impossible for the projectile to jam or wedge in the gun, either in loading or firing. Theoretically, this is impossible, and practically it has been proved so through many varying changes in caliber, charge, and weight of shot.

4. It is impossible for the shot to strip, that is, for the sabot to become detached, either in the gun or during flight, no matter how heavy

the charge or how light—within reasonable limits—the sabot. The highest degree of accuracy requires, of course, the *best* adjustment of the parts for guns of different power, but scarcely any probable mistake can ever make this projectile give a bad result, and never a dangerous one, either to the gun itself or to troops over whose heads it may be necessary to direct the fire.

5. That the friction of this projectile in the bore is a minimum is proved by the ratio of the pressures and velocities as compared with some other systems, and by the fairly constant character of that ratio through a long range of experimental firing. But that the action of the sabot is remarkably easy on the bore and rifling is also shown by the very small enlargement of the bores of the *soft-lined guns*, in which it has been almost exclusively used up to five hundred rounds, and even most of this enlargement is due to the setting out of the loose tube in the early stages of proof, and its compression under successive discharges.

6. The entire absence of balloting in the bore is also proved by the foregoing circumstances, and the absolute uniformity of its action in the gun eliminates, in the proof of either gun or powder, all danger of any anomalous result calculated to vitiate the purpose of the experiment; so that the quality of either gun or powder may be correctly gauged from the fact that an experience of thousands of rounds has shown this projectile to be a fixed quantity in the problem.

7. The projectile is as efficient in breech-loading as in muzzle-loading guns, and only requires, for convenience in loading and to prevent being inserted too far, a slight flare or "retention ring" on the periphery of the sabot.

8. As a breech-loading projectile, it is also believed to possess the advantage of easier action upon the bore than a solid band, which requires to be forced through the rifling with the greatest resistance before the shot can move in the bore. Moreover, the expansion device does not require fine or "knife-edge" rifling to give it efficiency. On the contrary, the bands may be quite as wide as in the muzzle-loader, and this is thought to be a consideration of some importance, as the bore is much less susceptible to injury; and should our heavy fortification rifles be called upon to fire grape or canister—a not unlikely contingency, I am told—it can be done without injury to the gun, whereas the bands which are made to cut through solid rings would in all probability be destroyed under like circumstances.

I am aware that the converted 8-inch and 11-inch guns were rifled with finer grooving than the first gun. This was of course necessary in order to adapt them to other projectiles; but we were never informed of any fault or short-coming on the part of the five hundred successful rounds with expansive projectiles from the original 8-inch breech-loader.

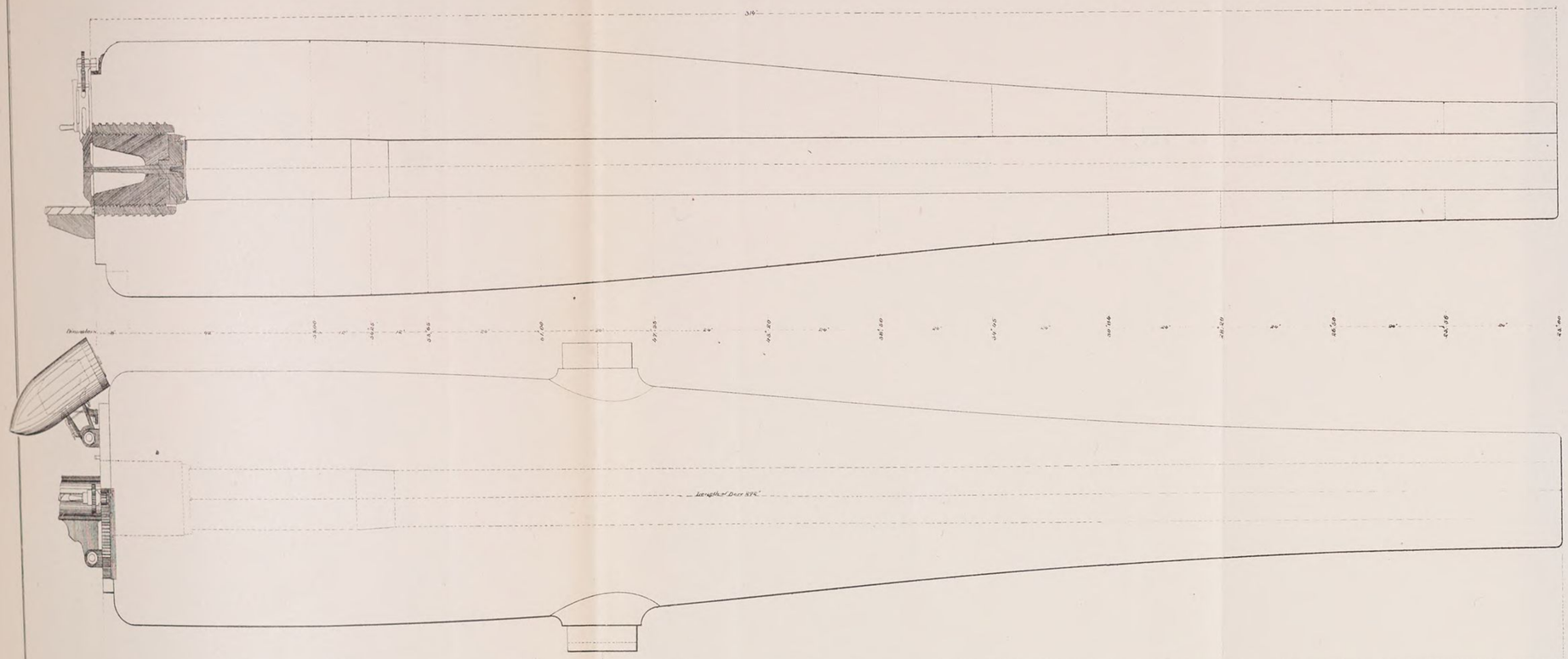
From the consideration of the foregoing I think it will become apparent, if not already sufficiently explained, why we deem it important that any experimental guns which may be constructed should be served with these expansive projectiles until they have passed a satisfactory point of proof; and why we have requested that in case your Board should recommend for construction any of the designs which we have had the honor to submit, they may be tested with our own projectiles, which are of such proved reliability, and with which every successful proof has thus far been conducted by the Ordnance Department, and which we should feel able to guarantee should introduce no uncertain or complicated question into the important problem of the gun proof.

It is probable that we might make some other projectiles at a trifling less cost to the government, but I know of none which would give us the same feeling of security as the expanding projectiles which I have the honor to lay before you. Amongst the drawings will be found those adapted to guns which have already been presented.

I am, very respectfully, your obedient servant,

WM. P. HUNT,

President of the South Boston Iron Company.

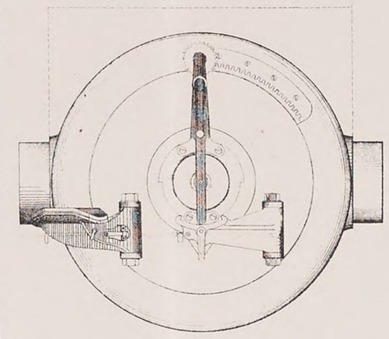


12 INCH B.L. RIFLE.

So. Boston Iron Co.

1881

Scale ¾



12 inch B.L. Rifle.
S.B.I.Co.

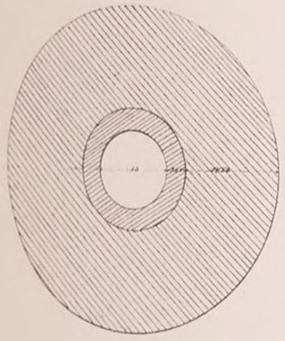
Total weight of gun	43 tons.
Total length of gun	376 inches
Length of bore and chamber	28.33 calibers
Pitch of rifling at breech	600 calibers
Pitch of rifling at muzzle	50 calibers
Number of grooves	28
Width of grooves	.833 inch
Depth of grooves	1/4 inch
Weight of Projectile	700 lbs.
Weight of Charge	150 lbs.
Conditional Charge	200 lbs.
Energy at Muzzle	17000 ft. lbs.
Penetration in iron	24 inches

12 INCH BREECH LOADING RIFLES.

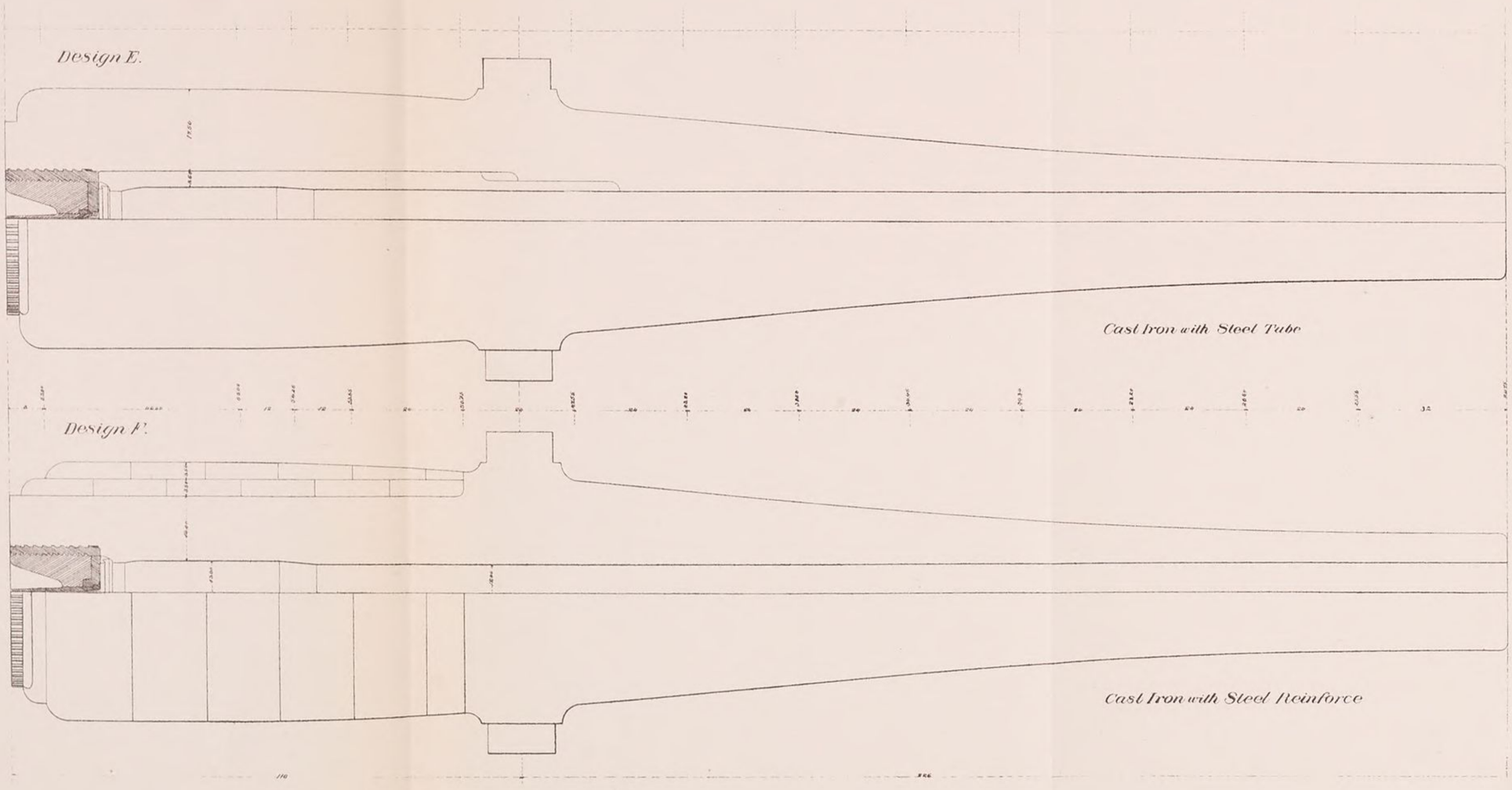
So. Boston Iron Co.

Scale

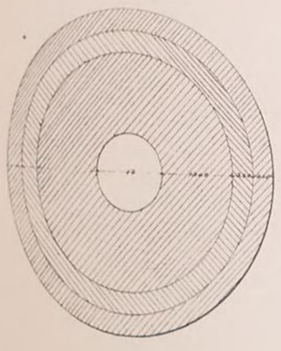
Section through chamber.



Design E.



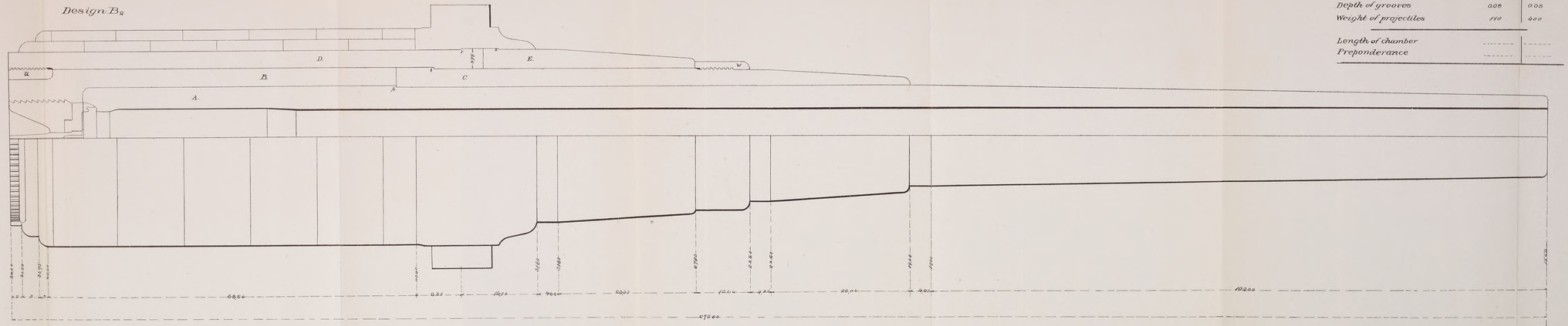
Section through chamber.



Design F.

SEN. EX. DOC. No. 118 pt 2, 1st SESS., 47th CONG.

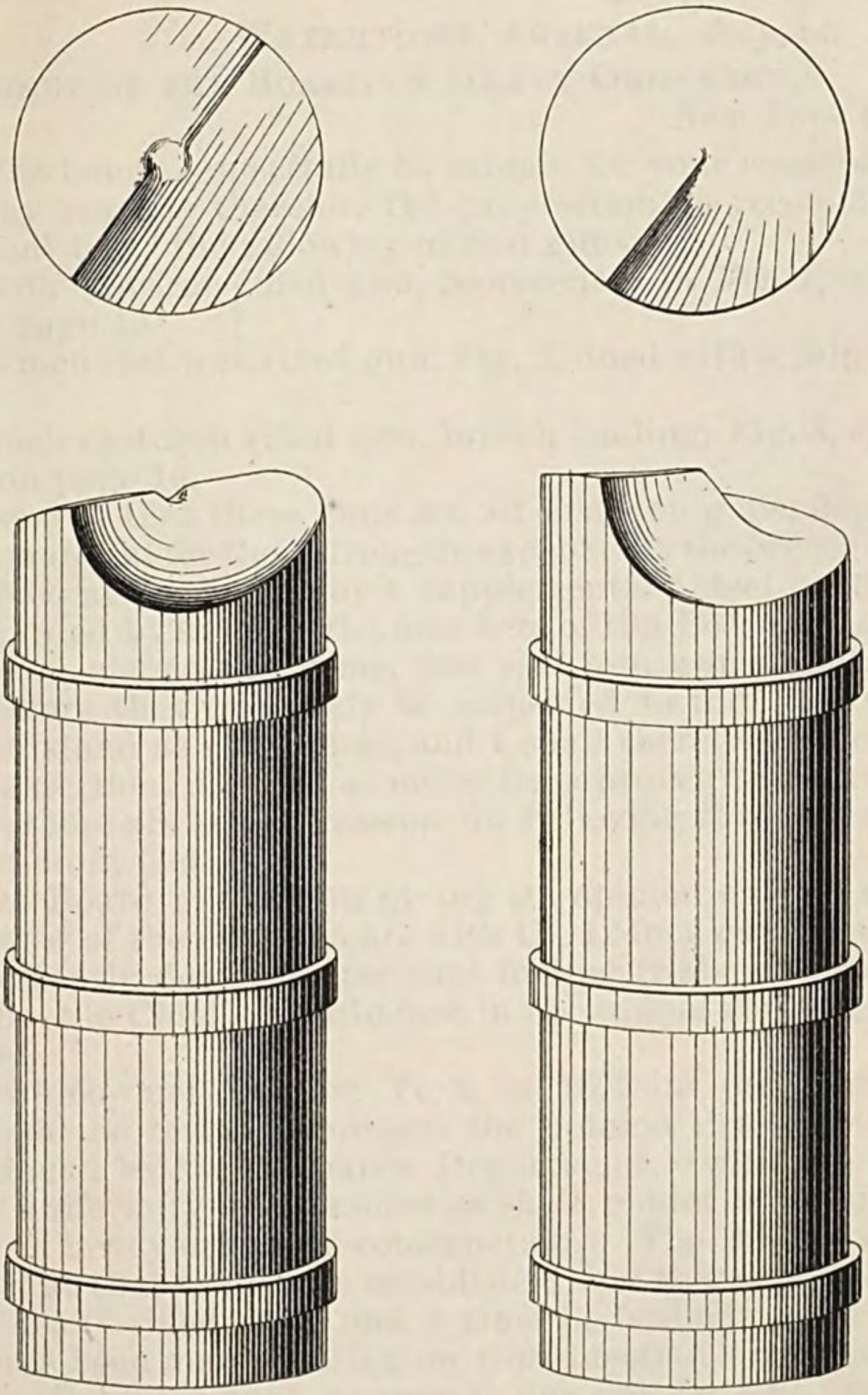
Design B_2



Pitch of rifling at muzzle	1 in. 45	1 in. 48
Number of grooves	17	21
Width of grooves	2.75	0.75
Depth of grooves	0.08	0.08
Weight of projectiles	190	400
Length of chamber	------	------
Preponderance	------	------

D. L. KENNEDY.

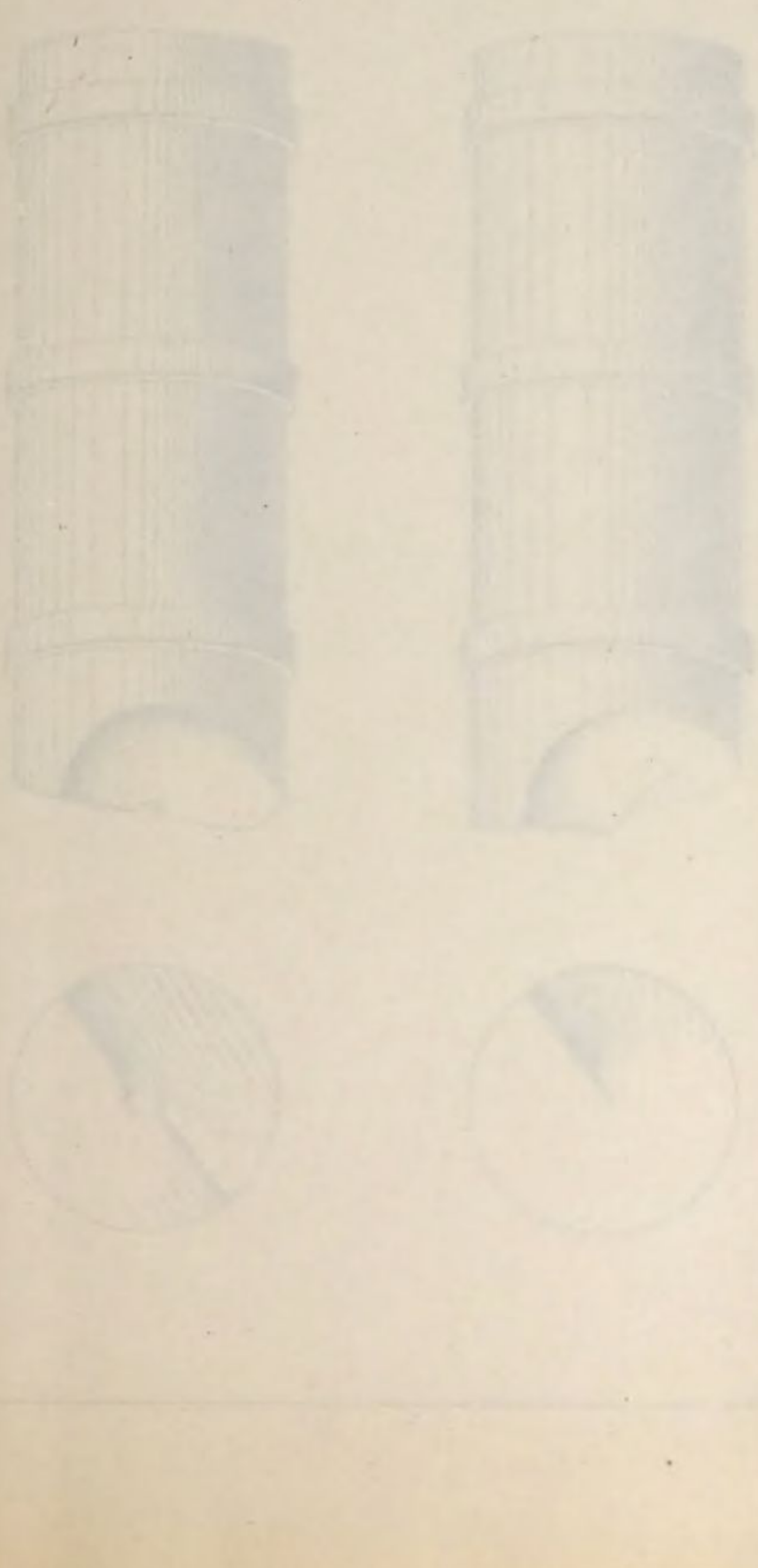
D. L. Kennedy, of No. 10 Cortlandt street, New York city, submits model and photograph of his projectile, with spiral-drill point.



D. L. KENNEDY'S

SPIRAL PROJECTILE.

SEN. EX. DOC. No. 178 pt 2, 1st SESS., 47th CONG.



COL. T. T. S. LAIDLEY.

L. R. No. 87.] WATERTOWN ARSENAL, *July* 14, 1881.

TO THE PRESIDENT OF THE BOARD ON HEAVY ORDNANCE,
New York City:

SIR: I have the honor respectfully to submit for your consideration, together with my reasons therefor, the proposition to recommend as "worthy of actual test" the following-named guns:

First. An 8-inch cast-iron rifled gun, represented in Fig. 1, and cast as described on page 15.

Second. An 8-inch cast-iron rifled gun, Fig. 2, lined with a thin bronze tube.

Third. An 8-inch cast-iron rifled gun, breech-loading, Fig. 3, and further described on page 16.

It will be observed that these guns are all cast-iron guns, depending solely upon this material for their strength, except only the breech-loader, which is reinforced at the breech by a supplementary steel band.

It may be regarded by some of the members of the Board an already-settled question, as claimed by some, that cast-iron guns require to be strengthened before they can safely be subjected to the strains which they have to withstand as rifled guns, and I shall therefore endeavor to show that this assertion, if true, has never been proved to be true, but, on the contrary, there are strong reasons for believing that it is entirely without foundation in fact.

The Ordnance Board of 1868, in giving its opinion on this subject, said: "The success of the experiments with the 12-inch cast-iron rifle at Fort Monroe evidently demonstrates that further trials with cast-iron, recommended by the Chief of Ordnance in his annual report for 1867, should be made."

The Board which met in New York in 1872 to designate what heavy guns should be tested expressed the opinion that experiments should be continued by the Ordnance Department, "with the view to obtaining such uniformity of pressures as shall render admissible the use of cast-iron in heavy-ordnance construction." The Board evidently did not regard it at that time as an established fact that cast iron would not answer for heavy rifled guns, and it must be borne in mind that no experiments have been made bearing on this question since that time. The Board was of opinion that, as soon as our powder and projectiles had been so improved as to give uniform results, cast iron would be available as a material for heavy guns. General Rodman had expressed to a committee of Congress the same opinion, and in 1873 the Chief of Ordnance, General Dyer, in his annual report, recommended, "in the spirit of judicious economy," an appropriation of $75,000 for the manufacture and trial of cast-iron 12-inch rifled guns. He gave in full the reasons for this recommendation, viz, that the improvements made in both projectiles and powder had been such that the former would offer a uniform resistance to the pressure of the powder, which in its turn gave "increased initial velocity, with marked diminution of pressure."

As Chief of Ordnance he must of necessity have known whether the results of experiments had already proved that cast iron was not strong enough to resist the strains, and on this account would not answer for

heavy rifled guns; that he did not know of any such experiments is clear from the fact that he said that "this recommendation is made in the spirit of judicious economy."

We have, then, the concurrent opinions of the Ordnance Board of 1868, approved by the Chief of Ordnance, the Board on Heavy Ordnance in 1872, General Rodman, and the Chief of Ordnance again, in his report of 1873, that the question of the fitness of cast iron for heavy rifles was not at *that* time determined, but was an open one, requiring further experiments; and as no tests have been since made, it follows that the question is still an open one, not definitely settled, but remaining to be solved by further trials.

I shall now proceed to show that the weight of evidence, from the endurance of cast-iron guns which have been tested, is in favor of this material as a suitable one for rifled guns of at least 8-inch bore, and to bring together a portion of this evidence, that you may impartially weigh it, and judge whether it be sufficient to warrant further trials being made with rifled guns constructed solely of this metal.

But what are the enormous strains that heavy rifled guns have to resist? When rifled guns of large caliber first began to be used, the quick powder and imperfect projectiles at that time used developed such enormous strains that it came to be generally believed that rifled guns were necessarily subjected to far greater strains than smooth-bore guns of the same size, and this opinion continued to obtain for many years thereafter. Even within a few years back, when the 10-inch converted gun blew out a large portion of the lining tube, tearing off with it the muzzle of the gun, it was accounted for by some by what was called the drag of the projectile passing through the bore. This opinion has, of course, ceased to be entertained.

Professor Bartlett and others have investigated thoroughly the strains brought on rifled guns, and it is now a well-established fact that these strains are only slightly greater than those borne by the smooth-bore gun. The 8-inch rifle projectile leaves the bore with only 48 feet less velocity, as calculated by Bartlett's formula, than would be communicated to the same projectile if it had no rotary motion. Powder and projectiles have been so improved that the action of each is as regular and uniform in the rifled gun as in the smooth-bore; and, as remarked by Professor Bartlett, the failure of rifled guns must be sought in some other cause than the superaddition of the pulling and twisting strains to that which acts to split the piece; and, so far as the principles of rifling are concerned, these guns may be made as safe as the common smooth-bores. The report of the Chief of Ordnance, 1878, page 425, gives the pressures on the bore obtained in the trials of three 8-inch converted guns, the endurance of which is regarded as so highly satisfactory that the Chief of Ordnance, speaking of it, says: "Our success has been so consistent, so thorough, so complete, that we consider it an admirable system of gun construction." One gun endured a mean recorded strain of 26,462 pounds per square inch from 710 rounds, another stood the same strain from 776 rounds, and a third was subjected to a mean recorded pressure of 27,189 pounds per square inch from 590 rounds.

The gun first mentioned was not required to bear a single strain as great as 29,000 pounds per square inch; the next endured three strains greater than 40,000 pounds, the greatest being 43,000 pounds, fifteen of 35,000 pounds or more, and three hundred and twenty-two of 30,000 pounds or more. The other, fired only five hundred and ninety times,

bore strains of 30,000 pounds or more, fifty-six times; 35,000 pounds or more, thirty-four times; 40,000 pounds or more, nine times; 50,000 pounds or more, four times; and one strain of 56,000 pounds per square inch. The length of the cartridge was 22 inches, and the area of the bore in rear of the projectile 595 square inches, making the aggregate strain endured by this last gun 16,177,455 pounds, repeated five hundred and ninety times.

Will an 8-inch rifled gun, made of cast iron, endure these strains this number of times?

This question is best answered by showing what cast-iron guns of this size have done. Only two cast-iron 8-inch rifled guns have been tested by firing with expanding projectiles. The record of the first I have been able to obtain only this far, that it was fired at Fort Monroe in 1864; it burst at the 1,047th fire, and of the last *eighty rounds* the pressures were as follows:

1 round, the pressure was less than	20,000 pounds per square inch.
5 rounds, the pressures were less than	27,000 pounds per square inch.
52 rounds, the pressures were	30,000 pounds or more per square inch.
32 rounds, the pressures were	40,000 pounds or more per square inch.
23 rounds, the pressures were	50,000 pounds or more per square inch.
13 rounds, the pressures were	70,000 pounds or more per square inch.
5 rounds, the pressures were	90,000 pounds or more per square inch.
1 round, the pressure was	150,000 pounds per square inch.

The other gun was fired in 1866 eight hundred and forty-five rounds, sustaining the following pressures:

28 rounds, the pressures were less than	20,000 pounds per square inch.
59 rounds, the pressures were less than	7,000 pounds per square inch.
766 rounds, the pressures were	30,000 pounds or more per square inch.
449 rounds, the pressures were	40,000 pounds or more per square inch.
222 rounds, the pressures were	50,000 pounds or more per square inch.
111 rounds, the pressures were	70,000 pounds or more per square inch.
13 rounds, the pressures were	125,000 pounds or more per square inch.
12 rounds, the pressures were	150,000 pounds or more per square inch.

This gun has since been fired nineteen times, making in all 864 rounds, and is still sound.

The charge of powder was in most cases 15 pounds, occupying 12 inches of the bore, or an area of 300 square inches.

Here we have two cast-iron guns which have been fired a great number of times and with greater strains per square of the bore pressed than either of the converted guns.

What the equivalent of a pressure of 150,000 pounds per square inch may be in terms of pressures of 27,000 pounds no one will pretend to be able to say. The only experiments which have been made on this subject show that a slight reduction in the strain adds very greatly to the number of times that it may be repeated. Thus, a specimen of cast iron, subjected to a strain of 30,000 pounds per square inch, endured this strain one hundred and twenty-five times, and its duplicate endured a strain of 27,000 pounds two hundred and fifty times. From this it would be fair to infer that twelve strains of 150,000 pounds per square inch would be equivalent to many hundreds of only 27,000 pounds.

Although these two are the only rifled cast-iron guns which have been tested by firing expanding projectiles, several smooth-bore guns of the same exterior size have been fired from time to time, and a consideration of their endurance will be instructive, and can hardly fail to give us a greater respect for cast iron as a material to be used in the construction of heavy ordnance.

The first to which I shall invite your attention is 10-inch gun No. 2, W. P. F., 1846, a chambered gun of imperfect model. It was fired—

100 rounds with 18 pounds of powder and 1 solid shot.
1 round with 18 pounds of powder and 2 solid shot.
1 round with 18 pounds of powder and 3 solid shot.
1 round with 18 pounds of powder and 4 solid shot.
1 round with 18 pounds of powder and 5 solid shot.
1 round with 18 pounds of powder and 6 solid shot.
1 round with 18 pounds of powder and 7 solid shot.
1 round with 18 pounds of powder and 8 solid shot.
1 round with 18 pounds of powder and 9 solid shot.
1 round with 36 pounds of powder and 9 solid shot.

It must be remembered that this powder was what is known as mortar-powder, and gave a strain with a single shot of over 70,000 pounds per square inch. What the strains were with the other charges can only be conjectured, but it is perfectly clear that they must have been very much more violent than any that modern rifled guns are ever made to bear; and that this gun should have endured the last charge of 36 pounds of quick powder and 1,130 pounds of shot without bursting, after having previously endured a number of enormous strains, shows that *this* cast-iron gun at least was not deficient in strength.

The next which I shall bring to your notice are 10-inch Rodman guns Nos. 362 and 363, F. P. F., one cast solid and the other hollow. These guns I fired in 1858 2,450 times each. They were afterwards fired by Captain Dyer, at Fort Monroe, 1,632 rounds more, making in all 4,082 times each, besides the proof-rounds, with the following charges:

2,396 rounds with 14 pounds of mortar-powder, 1 shot, and sabot.
12 rounds with 15 pounds of mortar-powder, 1 shot, and sabot.
14 rounds with 16 pounds of mortar-powder, 1 shot, and sabot.
15 rounds with 17 pounds of mortar-powder, 1 shot, and sabot.
1,645 rounds with 18 pounds of mortar-powder, 1 shot, and sabot.
1 round with 20 pounds of mortar-powder and wad.
1 round with 24 pounds of mortar-powder, 1 shell, sabot, and wad.

The guns are still unbroken. The pressures with 18 pounds of powder, when the guns were new, were 71,950 pounds per square inch, and at the close of the firing 39,793 pounds per square inch.

If we multiply the area of the bore in rear of the shot by the maximum strain per square inch, we find that these two guns for 1,600 rounds resisted a greater aggregate of strains each round than any of the converted guns, and in several instances nearly twice as much.

Here, then, we have two more cast-iron guns which have shown themselves not only capable of enduring greater strain than the converted guns are subject to, but also of resisting the molecular disturbance caused by firing 4,082 rounds.

The next 10 inch gun which was fired repeatedly with high charges was No. 1442, S. B. F., 1863. It was fired—

1,000 rounds with 15 pounds cannon-powder and 1 solid shot or shell.*
100 rounds with 20 pounds cannon-powder and solid shot.
100 rounds with 25 pounds cannon-powder and solid shot.
100 rounds with 30 pounds cannon-powder and solid shot.
100 rounds with 30 pounds quick powder and solid shot.

The pressures were, with 25 pounds of cannon-powder, 39,225 pounds per square inch.
The pressures were, with 30 pounds of cannon-powder, 54,000 pounds per square inch.
The pressures were, with 30 pounds of quick powder, 64,900 pounds per square inch.

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* One-fifth were solid shot, the rest shells.

The last 10-inch gun which was tested is No. 542, S. McM. & Co. This gun was supposed to be defective from having too great an initial strain in cooling. It was fired—

18 rounds with 18 pounds powder and shot of 127 pounds.
17 rounds with 20 pounds powder and shot of 127 pounds.
2 rounds with 22 pounds powder and shot of 127 pounds.
456 rounds with 25 pounds powder and shot of 127 pounds.
125 rounds with 26 pounds powder and shot of 127 pounds.
4 rounds with 27 pounds powder and shot of 127 pounds.
1 round with 28 pounds powder and shot of 127 pounds.
8 rounds with 30 pounds powder and shot of 127 pounds.
11 rounds with 32 pounds powder and shot of 127 pounds.
3 rounds with 35 pounds Oriental powder No. 5 and shot of 127 pounds.

645 total.

The pressures were as follows:

18 rounds, 20,000 to 30,000 pounds per square inch.
17 rounds, 22,000 to 60,000 pounds per square inch.
2 rounds, 23,000 to 26,000 pounds per square inch.
456 rounds, 22,000 to 65,000 pounds per square inch.
125 rounds, 21,000 to 72,000 pounds per square inch.
4 rounds, 33,000 to 51,000 pounds per square inch.
1 round, 54,000 pounds per square inch.
8 rounds, 26,000 to 100,000 pounds per square inch.
11 rounds, 19,000 to 58,000 pounds per square inch.
3 rounds, 10,000 to 18,000 pounds per square inch.

In estimating the work done by the gun at each discharge, it has been assumed that the part of the bore subjected to the maximum strain is that in rear of the shot at the moment of discharge; but the experiments of Noble and Abel show that with pebble powder the shot has moved about six inches from its seat at the time the strain has reached its maximum. No experiments have been made in this country, that I am aware of, to determine this point for our powders. In the smaller-grained powders, with which the guns just considered were fired, the shot, though lighter, did not probably move as far as in the converted guns, and on this account the amount of work done would have to be corrected somewhat, but to what extent we have not the necessary information to determine.

These experiments show what are the capabilities of cast iron as a material for guns; what it has done, and what it can be made to do. With such facts before the mind, it seems strange that any one can be found who doubts the reliability of cast-iron for rifled guns of at least 8 inches bore. It was the careful study of this demonstration of the ability of cast iron to resist enormous strains often repeated (results not generally known by officers) and an intelligent appreciation of their bearing and weight that led General Rodman to express the opinion that "after we shall have procured a projectile that is as certain in its operation in the rifled gun as the round shot is in the smooth bore, we can, by firing to extremity one or two 12-inch rifles, fix a limit within which the gun may be considered as absolutely safe." I, for one, am of the opinion that the conclusion is abundantly warranted by the facts.

But we, at this present time, are not required to decide the question of the fitness of cast iron for rifled guns solely on the evidence which has been just adduced. Within the last year or two other experiments have been made having an intimate bearing on this subject, throwing much light on it, and rendering it far easier of a definite solution. To these I shall now briefly allude.

In 1878 I induced the board for testing iron, steel, and other metals to grant me an appropriation of $1,000 to make experiments on the resistance to internal strains of thick cast-iron cylinders, some of which were to be lined with wrought-iron or bronze tubes. These experiments were not completed until September last, and proved conclusively that the cylinder was weaker in proportion as it was cut away to make room for the lining tube.

Cast-iron cylinders 11 inches in diameter and 22 inches long were bored out to a diameter of 3.3 inches, filled with beeswax to a depth of 10 inches, and a pressure applied to a closely-fitting piston until the cylinder was burst. Similar cylinders were bored out to receive a lining of wrought iron, formed of the same metal and in the same manner as the wrought-iron tubes used in the conversion of 10-inch guns, the interior diameter of the lining being the same as the first-mentioned cylinders. The circumstances of the trials were the same as nearly as possible in both cases, and the strength of the cast-iron cylinders was found to be about 18 per cent. greater than those lined with wrought iron. Experiments were also made to test the effects of continuing the bore through the breech and afterwards closing it with a screw-plug. These last cylinders were found to have about 5 per cent. less strength than that with a solid breech.

These experiments show that since a new and better gun can be made for a less sum than that paid for the conversion of the old gun, it was an error to convert any of the latter; but such conversion having been determined upon, it was an error to enlarge the bore at all with the view to increasing the thickness of the wrought-iron lining; and it further diminished the strength to continue the bore through the breech in order to insert the lining from the rear. It was also an error to make the tube in two parts, thereby still further decreasing its transverse resistance.

General Rodman has proved beyond a doubt that the sudden strain exerted by inflamed gunpowder does not partake of the nature of a blow, but is a pressure quickly applied and as quickly relieved; it differs from the pressure exerted by the testing machine only in the rate of application and release of the strain. The effect of this rapid application has been carefully considered by both Mallet and Rodman, and the conclusion reached is "that the excessive strain upon the gun above that due to statical pressure, caused by the most rapid rate of application or development of that pressure, is a very small percentage of the total strain." General Rodman based his whole system of gun construction upon the results obtained by the testing machine, and, so far as I am aware, the correctness of his conclusions has never been questioned. So, too, Colonel (now General) Rosset, of the Italian army, has based his present system of guns, in which the combination of wrought and cast iron has been rejected, on the results obtained by the testing machine.

It has been urged with great confidence by some that the results obtained by these experiments are in direct conflict with certain gunpowder tests made by Sir Joseph Whitworth, which are regarded as conclusive in proving that cast-iron guns are not as strong as similar guns lined with wrought-iron tubes.

The account of these experiments as given by Sir Joseph himself shows that they were undertaken to prove the superiority of his compressed steel over wrought iron, cast iron lined with wrought iron, and, in fact, all other materials for guns. He took a cylinder made of cast iron, "which I (he) knew to be of good quality," 26 inches long, 7.83

inches in diameter, and a bore of 2.56 inches. The ends were closed with steel plungers, after having introduced three ounces of powder, and secured by steel caps screwed on. The cylinder burst into twenty pieces. He adds:

I have also had a cylinder made of cast iron, with a coiled wrought-iron tube inside to represent the proportions adopted in the conversion of old 8-inch smooth-bore guns into rifled 64-pounders. The inner diameter or bore was 2.56 inches; the thickness of the wrought-iron tube, 0.690 inch; and the outside diameter, 7.83 inches. The area of cast iron was not sufficient to support the end strain, and the caps were held together by additional screws fitted into an external casing. Four charges were fired, the weight of powder being 5, 6, 8, and 10 ounces respectively. The enlargement of the cylinder after the discharge of 8 ounces was 0.0317 inch on the inside, and 0.0017 on the outside. The fourth discharge of only 10 ounces broke the cylinder into fragments, viz, of cast iron *one hundred and seventy-four*, and of wrought iron seven pieces.

It is to be borne in mind that these experiments were not made for the purpose of comparing cast-iron guns with similar ones lined with wrought iron; the cast iron in the two cases was not identical; it was not gun-iron, and therefore the comparative strength of the two cylinders proves nothing as to the strength of *guns* lined and not lined with wrought iron. That the iron was not gun-iron is evident from several considerations. In the first place it is not spoken of as anything more than "good iron." How good it was, what was its tensile strength, its density, elasticity, or extensibility, is not stated, and was not probably known. An iron which will stand 12,000 pounds per square inch is in England considered a good iron; but we do not think of making guns of such metal; for this purpose only the best cold-blast charcoal iron, melted in an air-furnace, and having a tensile strength of 30,000 pounds per square inch as the minimum, with a good extensibility and elasticity, is ever thought of as a proper gun-iron.

The very fact that 3 ounces of powder burst a cylinder of 2.56 inches bore and 2.5 inches thickness shows conclusively that the iron was not gun-iron, and the additional fact that 10 ounces of powder burst a similar cylinder 1.945 inches thick, with a wrought-iron lining 0.69 inch thick, into *one hundred and seventy-four fragments*, is incontestable proof that this was not such an iron as guns are made of.

It is further to be observed that the two cylinders were not tested under the same circumstances. The lined cylinder was entirely relieved from all longitudinal strains, for "the caps were held together by additional screws, fitted into an external casing." That this arrangement enabled the lined cylinder to offer greater resistance there can be no doubt, but to what extent it is difficult to estimate.

That any logical conclusions conflicting with the results obtained from my experiments on cylinders can be drawn from Sir Joseph's powder tests just described is so evidently impossible that further remark is unnecessary.

If, however, in place of my deductions, based on these trials, you should prefer to have the results of direct experiments, I am glad to be able to lay such results before you, for I have recently had the satisfaction of witnessing some carefully conducted experiments made by Capt. John G. Butler, Ordnance Department, wherein he proposed to repeat Whitworth's powder test of iron cylinders, using our gun-iron of known good quality. Two cylinders were cast from the same ladleful of metal, turned to the same exterior dimensions, and bored out the same as Whitworth's, and one of them lined with a wrought-iron tube of the best quality. These were fired with 3, 4, 6, 8, and 10 ounces of powder taken from the same barrel. After resisting the 8-ounce charge, the simple cast-iron cylinder showed no increase in the exterior diameter; the lined

one was enlarged 0.008 inch. The bore of the former had enlarged 0.015 inch, the latter 0.052 inch; and it is plain that the lined cylinder was nearer the point of rupture than the other. The charges of 10 ounces, which increased the strain more than 25 per cent., ruptured both cylinders, the cast iron of each breaking into twenty-six pieces, and the tube into seven pieces additional.

This powder test, then, confirms the results of the experiments made with the testing-machine, and extinguishes forever the unsupported claim of the superior strength of the lined cylinder.

I have still one more fact which I wish to lay before you before closing my argument in favor of the superior strength of cast-iron guns over those lined with wrought-iron tubes: it is the result of an experiment made with gunpowder, and it seems to me to be conclusive on this subject.

Finding that there was no prospect of the Ordnance Department authorizing any experiments to show whether gunpowder would confirm or disprove the verdict of the testing-machine in regard to the strength of cast-iron guns, and regarding the question as one of great importance to the country, I proceeded to procure on my own account two cast-iron guns, representing accurately in exterior model the 10-inch Rodman guns to a scale of four-tenths the full size, and to line one of them with a coiled wrought iron tube, made in the same way and of the same metal as the tubes used in the conversion of guns; the other was of simple cast iron. The guns were cast solid from the same ladleful of metal, and were finished without trunnions, and of the same size in every particular as nearly as possible. The model selected was that of the converted 8-inch rifle. The maximum diameter was 12.8 inches, and that of the bore 3.2 inches. The weights were 955 and 931½ pounds, respectively. The guns were fired under the same circumstances, with charges of 2.5 pounds of powder, and first with a shot weighing 22 pounds, second with one of 30¼ pounds, and afterwards with two shot of the last-named weight. The cast-iron gun proved superior to the lined gun in about the same proportion as had been found by the experiments with statical pressures, and we have the verdict of superior strength of the cast-iron gun over that of cast-iron lined with a wrought-iron tube, pronounced in the first place by the testing-machine, now confirmed by actual trial with gunpowder in a gun of 3.2-inch bore. I have only briefly referred to these trials, for the reason that my reports of September 11, 1880, and June 25, 1881, to the Chief of Ordnance, will doubtless be laid before you under the direction to "furnish the Board with all the information on the subject in his possession."

I am of the opinion that it is not advisable to convert the 10-inch smooth-bore guns into rifles. The object of the trials which I here propose is to show that it will be far more economical to make new guns, which shall be in every respect superior to the converted guns, and can be produced at the same or less cost. I propose to make an 8-inch rifle longer and heavier than the converted gun, to cast it breech uppermost, the hollow core passing through the breech, with the view of avoiding the initial strains that are known to exist in guns cast with a solid breech; to fire it to extremity with a proper powder, to be determined by trial, which shall give an initial velocity of 1,290 feet or more, or continue the firing until its superiority shall be conclusively established.

It is well known that cast-iron guns begin to break from the interior, cracks form, and the gases, entering therein, act on a larger area, and finally burst the gun. The extent to which this shortens the life of the gun is not known, and it is proposed to determine it by the gun No. 2,

which has a thin tube of bronze lining the bore; the tube may be turned and grooved on its exterior and then inserted in the bore, or the cheaper plan of lining only the chamber may be used.

It is proposed to fire this gun under exactly the same circumstances, with the same charges, &c., as the first, and thus determine the question whether the increased cost is compensated by the greater endurance of the gun.

The Heavy Ordnance Board of 1872 recommended that a breech-loading gun, with the slotted-screw breech similar to that used by the French, Swedes, and Italians, should be tested. No such trial has ever yet been made by the Ordnance Department, and the success which has attended this plan in other countries and our own Navy, its greater simplicity and less cost, compared with the plan adopted, render it highly desirable that a fair trial of its merits should be made.

No. 3 represents such a gun. It will be cast breech uppermost, cooled from the interior, and have a thin band of steel around the breech.

The guns here proposed have received the approval of one of the great gun-founders of the country, who has adopted the first and second, the latter without the supplementary steel band, and recommends them as good models for cast-iron guns.

The vast extent of our sea-coast which calls for protection is so great as to require large rifled guns by the thousand; and the question of what material they shall be constructed becomes one of the greatest importance. We have cast iron of the best quality, and we understand the manner of treating it in order to make uniformly superior guns of the largest caliber. If these guns will answer as well as those of more expensive construction, it is highly important that we should know it at once. If they shall prove to be superior to those which we are now making, as I believe they will do, and as I think the facts which I have here adduced will warrant us in believing, we cannot have the proof of it too soon.

General Rodman proposed to improve the quality of our cast-iron guns by improving the metal of which they are made, and the best mode of doing this he carefully elaborated; but the present adopted plan of increasing the efficiency of our heavy ordnance discards this plan, and in its place adopts a certain combination of wrought and cast iron, thereby adding greatly to the cost of production, and, according to the results of the experiments just mentioned, diminishing in a marked degree the strength and endurance of the gun. Whether it be advisable to continue the fabrication of large guns on this latter plan without first comparing their endurance with that of cast-iron guns pure and simple, as herein proposed, is a question left to you to decide, with the aid of all the light that can be thrown upon it by the latest experiments, supplemented by such as you may deem it wise to make.

T. T. S. LAIDLEY,
Colonel of Ordnance.

L. R. No. 273.] WATERTOWN ARSENAL, *April* 24, 1882.

To the PRESIDENT OF THE BOARD ON HEAVY ORDNANCE,
New York City:

SIR: I have the honor to submit herewith for your consideration a drawing of a gun which, it seems to me, is worthy of being tested by actual trial to determine precisely what its merits are.

I assume it to be a fundamental principle admitted and accepted by

all that, whatever kind of gun may be finally adopted for the military service, it must be such as can be produced in this country, of American materials, and by our own workmanship. At the present time, with existing plants, it is not possible to make the steel built up guns of Krupp or Vavaseur, and it is a matter of questionable propriety whether the expensive plant required to make these guns should be provided before we have definite information that they are decidedly superior to all others of every kind and description.

The manufacture of low-grade steels has not so far progressed as to enable the manufacturer to produce at this time a reliable material of uniform quality. This fact has been made patent by the tests made at this arsenal of eye-bars intended for bridge construction. Civil engineers have of late years been led to adopt to a considerable extent this material for bridges, but whether wisely is not so certain. A steel eye-bar, such as were used in an important bridge in the West, on being tested, broke with a tensile strain of 49,300 pounds per square inch, with an elongation of 0.53 per cent. A number of eye-bars 6½ inches wide and 1 to 1⅝ inch thick were tested from another bridge, and the variation in ultimate strength was from 46,589 pounds per square inch to 74,896 pounds per square inch, and the elongation from 1.7 to 14.2 per cent. The carbon varied from 0.09 to 0.559 per cent. A steel stirrup 3.3 inches diameter, supposed to contain 0.15 per cent. carbon, broke with a strain of 42,000 pounds per square inch. Analysis showed that it contained 0.46 per cent. These facts prove conclusively that the element of uncertainty in the production of low steels is very great, and this, it must be remembered, occurs in small bars, which are easily and thoroughly heated and wrought. What wide variations in strength, then, must we not expect in immense masses, which may readily be injured in heating, and which can be with difficulty wrought at all, and certainly not with any degree of uniformity? Must we not expect that these large pieces will have hurtful initial strains, and will it not be utterly impossible to bring the different parts to the breaking point at the same time? In the manufacture of guns we want a material which we can rely upon for uniformity of results. It is better that we should have a weaker material, if we can count on its uniformity of behavior under all circumstances. For this reason I have advocated the test of a cast-iron gun pure and simple. By the exercise of proper care in the selection of the metal we may be reasonably certain of the gun produced, and by still closer attention to the processes of manufacture, from the first selection of the ores to the finished casting, this uniformity may be doubtless increased.

If it be not the settled determination of the government to reject all kinds of constructions for guns in which cast iron shall enter in any form (and that the information on this subject is of so definite and convincing a character as to warrant at this time the formation of such a resolution would seem to be more than doubtful), it becomes a matter of the first importance that we should know exactly what strength we can calculate upon in guns made wholly of cast iron, that when we come to consider the strength of guns made up of a combination of two or more metals we may be able to ascribe to each the resistance offered by it to the explosive force, and not leave to assumption or guess the determination of this all-important point.

Of late we have heard much of high-power guns, and the great advantages to be derived from their introduction into service. There are doubtless certain positions where it is important that we should have guns capable of throwing their projectiles with the highest possible velocity, but it by no means follows that all our guns should be of this kind, as they

must of necessity be more expensive, and involve greater expense and difficulty in providing them with suitable carriages.

In designing the gun which I have now the honor to present to your notice, and proceed to describe, I have kept in mind the above facts, and I propose it with the view to meet the want which may be felt for guns which shall have the power of imparting a higher velocity to the shot than could be effected by a simple cast-iron gun. I have selected cast iron for the body of the gun, which is of the simplest form, without any projections, and made thus for the special purpose of thereby avoiding as far as possible all hurtful initial strains in cooling. The gun is turned and bored to the finished dimensions, being cylindrical from the breech to the front of the trunnions, and of sufficient thickness of metal to resist the longitudinal strains to which it may be subjected in firing. A thin brass lining is inserted in the chamber, for the reason that I believe that the endurance of the gun may be still further increased by this simple and inexpensive addition, in which opinion I am happy to be confirmed by Mr. Paulding, of the West Point Foundry, and other persons for whose practical experience I have great respect. The ring embracing the trunnions is cast separate from the body of the gun, turned and bored to the proper size, and shrunk on. Two circular rings of low steel are turned to fit the body, and bored near the outer periphery with a series of small holes, and a bronze nut is screwed on the breech to hold the rear ring in place. The gun is placed in a lathe, and wrapped with fine steel wire, with a constant tension from the breech to the trunnions, as thread is wound on a spool. The end of the wire is secured in a small hole bored in one or other of the steel rings. The wrapping is continued till the wire has reached the holes bored in the rings, when the wire is laced longitudinally back and forth in the slots previously cut for this purpose, joining the two rings securely. A final wrapping at right angles to the axis of the gun over the longitudinal lacing, with a coat of paint, protects the wires from injury, and completes the construction of the gun.

We have here a cast-iron gun, the successive layers of which are placed one upon another, with the proper initial tension, without any hurtful strains, re-enforced at the part where the greatest strength is required with the strongest material that can be used in the construction of a gun, and this re-enforce is supplied without injury to the strength of the material of which it is composed, and with a still further carrying out of the principle of initial strains applied in its proper direction. The construction is simple and inexpensive, requiring no new fixtures or appliances, and is applicable to guns of largest caliber. It seems to me that the prospect of favorable results from its test are such as to warrant its recommendation for this end.

Captain Butler has placed on the same sheet (Fig. 2) an alternative design suggested by the gun above described, and if the shoulders of cast iron forming the flanges for the wire wrapping should exercise no injurious influence in the vibrations caused by firing, the gun might be thus made of fewer parts.

Respectfully, I am your obedient servant,

T. T. S. LAIDLEY,
Colonel of Ordnance.

CAST-IRON GUNS. PROPOSED FOR TRIAL.

To the board on Heavy Ordnance 1881.

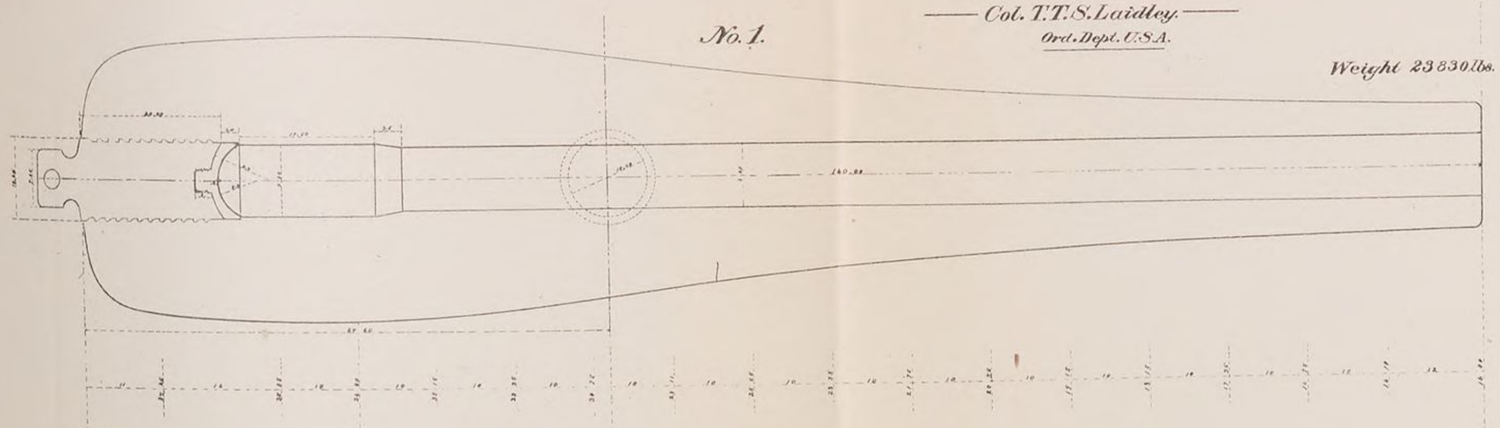
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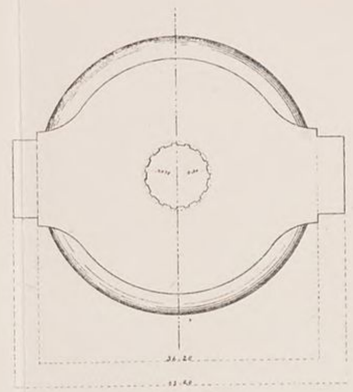
Col. T.T.S. Laidley.

Ord. Dept. U.S.A.

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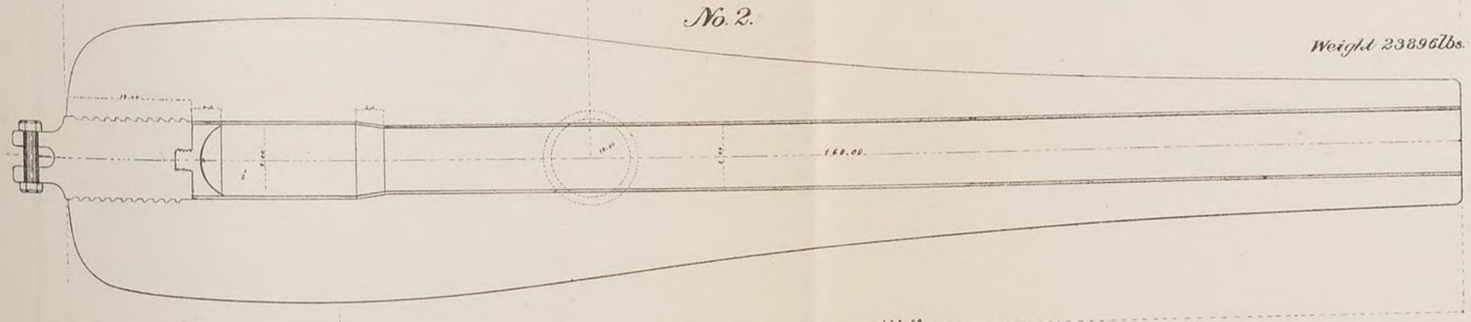
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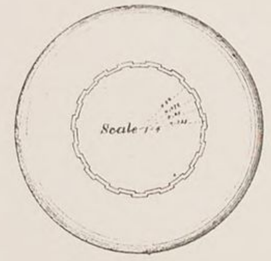


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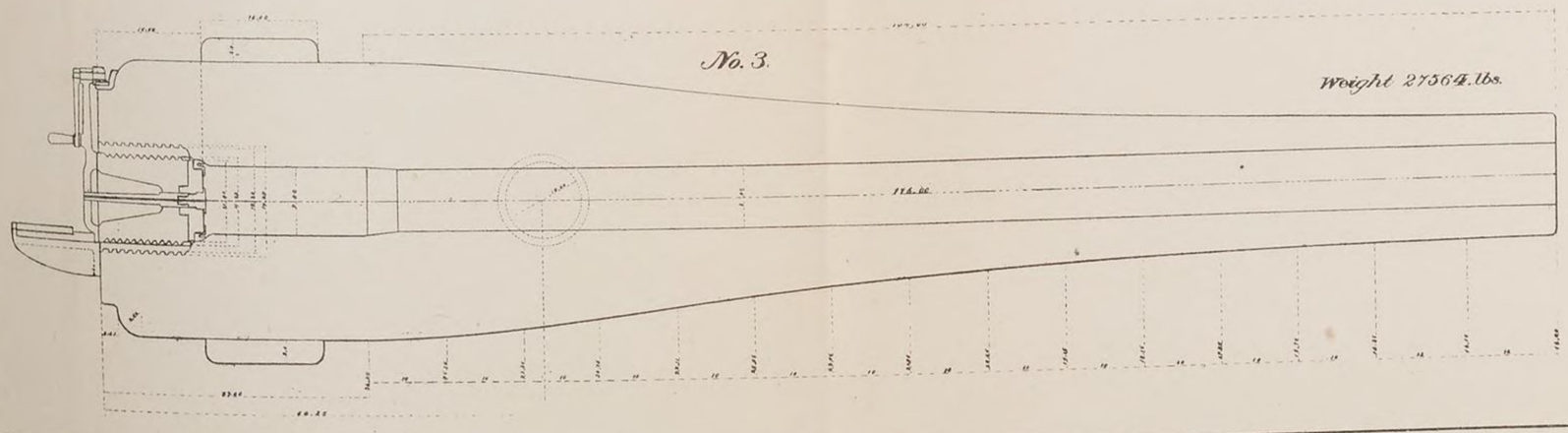


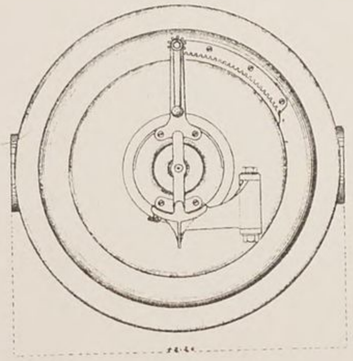
Scale 1-8



No. 3.

Weight 27564. lbs.





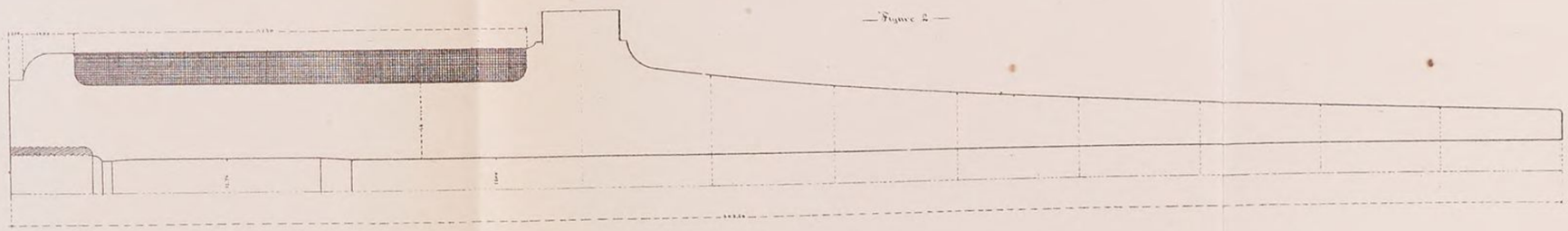
SEN. EX. DOC. No. 178 pt 2, 1st SESS., 47th CONG.

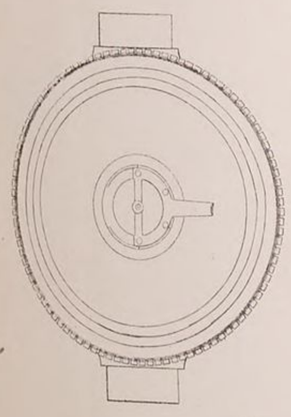
Cast Iron Wire wrapped Breech-Loading Rifle 12 inches Calibre.

Prepared for
the Board on Heavy Ordnance
by
T.T.S. Laidley
Colonel of Ordnance
1884.

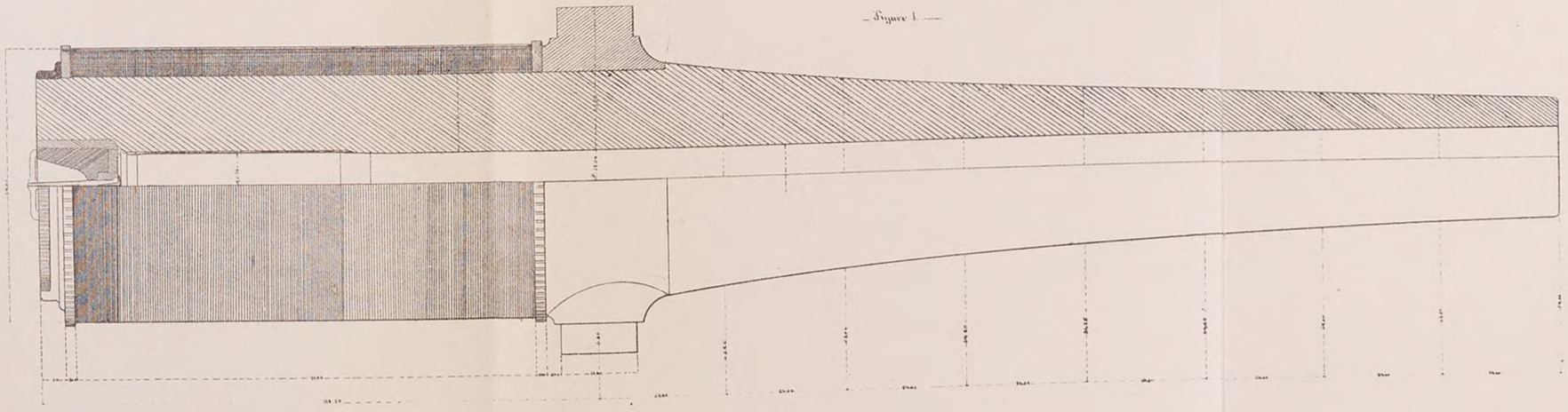
Scale one eighth

— Figure 2 —





— Figure 1 —



WATERTOWN ARSENAL MASS.

SEN. EX. DOC. No. 178 1st SESS., 47th CONG.

MAJ. S. C. LYFORD.

L. R. No. 281.] THE FRANKFORD ARSENAL,
Philadelphia, Pa., May 2, 1882.

The PRESIDENT OF THE BOARD ON HEAVY ORDNANCE,
New York:

SIR: I have the honor to invite your attention to a letter addressed by me in January, 1878, to the Chief of Ordnance, U. S. A., and the indorsements upon it (copy appended), suggesting a new way of making tubes for lining cast-iron ordnance.

In that letter it will be observed that it was proposed to build a tube by rolling a sheet of iron around a mandrel, and then welding by passing the tube through rollers, the idea being to give great longitudinal with no sacrifice of transverse or tangential strength.

This letter having been brought to the attention of Maj. Geo. W. McKee, of the Ordnance Department, by his advice and assistance I have had prepared, under his personal supervision, and in accordance with the data he has furnished, the plan of a 12-inch breech-loading gun, which I beg to submit for the consideration of the Board of which you are the president.

In the present plan it is proposed to construct the tube for the gun in a way to secure the same result, and, practically, by the same method, except that the tube will be made in one length by building up several tubes of sheet iron, telescoping them together, and welding by rolling, at the same time reducing the tube to its proper dimensions.

The first of the series of tubes will be of sheet iron, one inch or more in thickness, lap-welded; over this will be slipped another one, closely fitting, of the same or other thickness, and made by the same process; over this, in succession, two other tubes similarly made, and all breaking joints. The series of tubes may then be brought to a welding heat, and welded by means of rolls till the mass becomes homogeneous.

Another series of tubes is then built up in the same manner and telescoped over the first series and then welded; and so on till the combined tubes have been formed into a homogeneous whole of the proper dimensions.

As shown in the accompanying drawing, the breech end of this completed tube is strengthened by shrinking welded coils of iron upon it.

A gun so strong, as regards tangential, torsional, and longitudinal strain, as herein represented, may be reduced in length so as to weigh not exceeding 57 tons; but I believe our experience from native and foreign sources will not justify us in sacrificing *safety* and *power* to the question of weight; a matter of little moment, within limits, as regards a few tons when the gun is balanced on its trunnions. The additional weight aids the engineer in reducing the length of recoil, and, above all, it gives the artillerist confidence in the strength of his piece.

The proposed gun is simple in construction and can be made in America by manufacturers accustomed to similar work, whenever inducements are extended to enable them to increase their plant over its present capacity.

It is a strong gun; as strong, if not stronger, than any ever made, and will be able to throw a projectile equal in weight and with as high a velocity as any gun of its caliber in existence.

In its proposed construction a pressure of 81,000 pounds per square inch just reaches the low elastic limit of 20,000 pounds for this thickness of walls. Great length has been given to the gun, and it has been made exceedingly strong, so as to be a gun which cannot be broken by ordinary gunpowder without giving early warning of danger. The dimensions, in length particularly, can be readily reduced, as before stated, so as to present a piece weighing about 57 tons, but it is desired to give at first a drawing representing a principle of construction, and a powerful and safe engine with the greatest volume of expansion for the fired gunpowder.

The fermature may be either the French or Krupp. If the former, possibly a steel sleeve might be screwed in to receive the plus-screw of the breech-block. Obturation will be readily obtained by this system. It may be illustrated in the present French small-arm.

Attention is invited to the shape of the chamber of the proposed gun, suggested and designed by Major McKee, which it is believed will give better results in air-spacing than any hitherto used here or abroad. It conforms to Professor Bartlett's theoretical wave surface (see Bartlett's Mechanics, pages 387 to 394).

An 8-inch gun can be made at once on this plan, using the plant now available for immediate work. Such a gun construction, with ellipsoidal chamber (conjugate axis 10 inches, length of chamber 21 inches), will consume 60 pounds of powder with perfect safety, will accomplish much more than the work sought to be attained by the recent chambering of the 8-inch converted rifles, and will, in all respects, rank as a powerful defense gun. It will fill the requirements of the Engineers for a light and powerful primary rifle as an adjunct to the smooth-bores, throwing canister against torpedo destroyers, as suggested recently by the Engineer Board.

This gun can be constructed in a very short time, and, as the cost of construction is not great, it is believed the government would find it greatly to its advantage to construct one for trial. The principal dimensions would be about as follows:

8-INCH RIFLE—CHAMBERED.

Charge	pounds..	60
Weight of projectile	do	180
Length of rifled bore	inches..	145
Length of chamber	do ...	21
Entire length of piece	do ...	181
Maximum diameter of piece	do ...	37.4
Diameter at muzzle	do ...	16
Maximum diameter of gun-tube without re-enforcing band	do ...	21.7
Weight of piece	pounds..	23,000

This is, perhaps, unnecessarily strong. A pressure of 100,000 pounds per square inch will just reach, for this thickness of walls, the elastic limit of 20,000 pounds.

A 10-inch rifle, weighing not more than 35 tons, may also be constructed with the plant at present available. This gun, in the language of an able government expert, an experienced practical artillerist and mechanic, "will be a very formidable rifle, easily handled, and capable of doing great damage to an enemy's vessels."

In this connection I would state that some of the ablest iron-workers and practical mechanics in the country have no doubt whatever of the great strength of this principle of construction.

It may be objected to the employment of wrought iron that the "lands" will soon be eroded. Nothing of the kind will take place to any sensible

or injurious effect; and in proof of this I respectfully refer to the wrought-iron tubes now at Sandy Hook. Some of them have been fired a great number of times, one over 800 rounds, if I remember correctly. No complaint, either, was ever made against seaming in the *old* rifled Springfield muskets.

Very respectfully, your obedient servant,

S. C. LYFORD,
Major of Ordnance, Commanding.

P. S.—Through a mistake in the drawing the tube is represented as 12 inches at its maximum thickness. It should be 11 inches. This will reduce the weight of the gun to 64 tons, roughly estimated at 67 tons here.

ORDNANCE OFFICE,
January 10, 1878.

CHIEF OF ORDNANCE, U. S. A.,
Washington, D. C.:

SIR: It has occurred to me that in the conversion of our Rodman guns, and in future constructions of heavy rifles, a better and cheaper tube for lining than that now used might be made by rolling a sheet of boiler iron about a mandrel and welding it. These tubes could easily, I think, be made in lengths at least up to 6 feet, and as many as necessary be screwed together to give the proper length for the gun. It seems to me by this method all danger of imperfect welds will disappear and the joints screwed together be stronger, or at least as strong, as those now made by welds. I am aware that the method of making such a tube is not new, as it is essentially the same as that used in the construction of the 3-inch wrought-iron gun, nor the method of fixing the joints by screwing them together, but I think the construction of such a tube for such a purpose as proposed is novel, at least I have never heard it suggested. If this method is thought worthy of trial I have no doubt but that the tube can readily be procured from the Phœnixville Iron Company or elsewhere.

Respectfully, your obedient servant,

S. C. LYFORD,
Major of Ordnance.

[First indorsement.]

ORDNANCE OFFICE,
January 10, 1878.

Respectfully referred to the Ordnance Board for consideration and report. This method would certainly prevent the lining being dragged out by the projectile, and deserves careful examination.

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

[Second indorsement.]

THE ORDNANCE BOARD,
New York City, February 11, 1878.

Respectfully returned to the Chief of Ordnance. No physical data as to the qualities of wrought iron, manipulated as it would be in the construction of tube-sections on the plan proposed, are at hand, and as the important elements of tangential strength, as well as uniformity of strength, may be affected by the process to be employed, the Board

cannot express an intelligent opinion as to the advisability of the construction of such a tube until some experiments have been made in the direction indicated.

The tube would have to be made in sections and these butt-welded, or united by other means.

The first practical steps in this matter, hence, would be to procure an experimental block, made after the manner proposed, and have it cut up and subjected to physical tests.

The Board would advise inquiry of the Phœnix Iron Company, with the view of procuring, if practicable, a specimen block of the desired dimensions for the necessary investigation of the subject.

Regarding the question of providing for increased longitudinal strength, the Board has to state that two experimental guns, a 10-inch and an 8-inch rifle, lined with coiled wrought-iron tubes, are now being prepared, and in which are introduced devices for securing increased longitudinal strength over the present system.

S. CRISPIN,
Bvt. Col., U. S. A., Lieutenant-Colonel of Ordnance,
President of the Board.

Shape and dimensions of the chamber of Maj. S. C. Lyford's proposed gun.

DISCUSSION BY MAJOR MCKEE, ORDNANCE DEPARTMENT.

THE CHAMBER.

This, as will be seen at a glance, is a portion of a prolate spheroid. It conforms in every respect to the wave surface of Professor Bartlett, and, it is believed, will give the best results yet attained in the way of air-spacing.

DIMENSIONS.

These are calculated strictly on the physical laws laid down by Rodman and Bartlett. Based upon the empirical results of actual experiment and the facts of mathematics, a wide margin of safety has yet been left. With the low elastic limit of 20,000 pounds the greatest thickness of walls over the chamber has been calculated from this formula of Bartlett.

$$C = -\gamma\left(1 \pm \sqrt{1 + \frac{8}{\pi} \cdot \frac{P}{M\frac{8\gamma}{\gamma}}}\right)$$

whence C = 80994+.

Or, in other words, where a pressure of 81,000 pounds per square inch is brought upon the chamber, a tensile force of just 20,000 pounds will be exerted upon the wrought iron.

This is a low elastic limit, and it will be seen how, with our improved powders, it will be difficult even to strain the gun.

With a tenacity of 60,000 pounds per square inch, we find from this equation—

$$P = \frac{\pi}{8} M \frac{8\gamma}{\gamma} C\left(\frac{c}{\gamma^2} + \frac{2\gamma}{}\right)$$

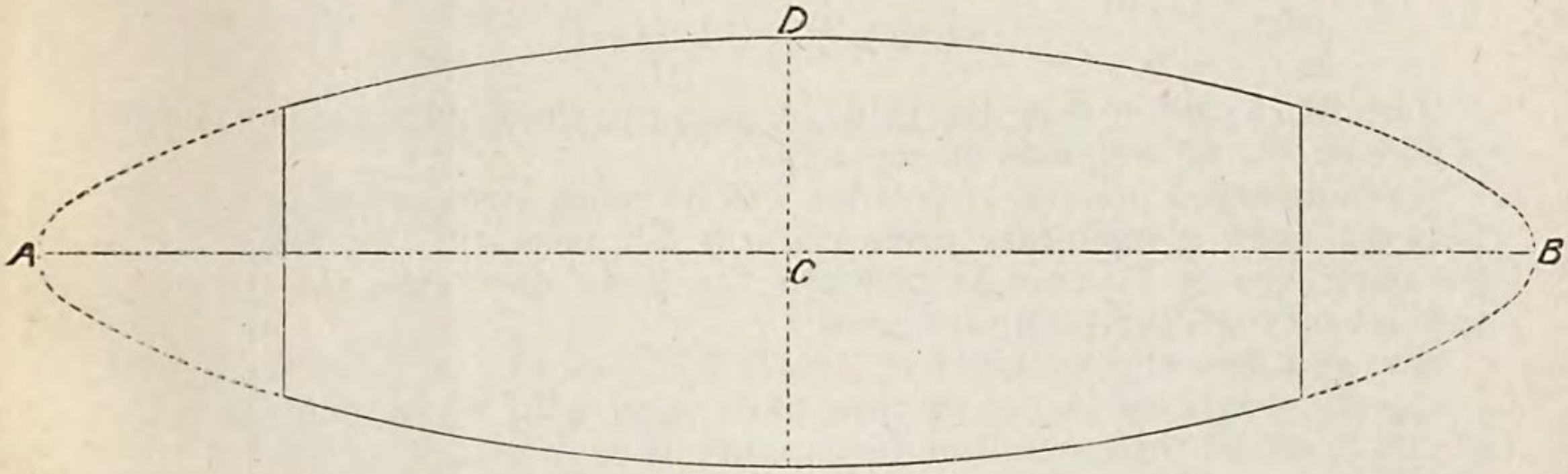
$$P = 317778+$$

Or, the gun will not reach its limit of tenacity, or breaking point, until the above pressure per square inch is brought to bear upon it.

At the point of half-pressure, the thickness is taken at 11 inches, and this is continued beyond that point towards the muzzle. This is a greater thickness than is called for by the formula, the radius at this point being 6 inches.

Again, at the muzzle the thickness is 5 inches, being greater than is theoretically necessary. This is done to give great longitudinal strength to the gun, and to provide against the so-called transverse strain.

This chamber is illustrated thus:



The equation of the ellipse gives

$$y^2 = \frac{b^2}{a^2}(a^2 - x^2)$$

whence, for the ellipsoid of revolution,

$$V = \int \pi \frac{b^2}{a^2}(a^2 - x^2)\,dx = \frac{\pi b^2}{a^2}\left(a^2 x - \frac{x^3}{3}\right) + C$$

Estimating the volume from the plans through the center perpendicular to the transverse axis, we have $x = 0$, $c = 0$, and

$$V' = \pi \frac{b^2}{a^2}\left(a^2 x - \frac{x^3}{3}\right)$$

or, in the case in point, $a = 54.75$, and $x = 31$, and, also, $x = \frac{31}{54.75}a$.

Therefore,

$$\int_{x=0}^{x=\frac{31}{54.75}a} \pi \frac{b^2}{a^2}(a^2 - x^2)\,dx = \pi \frac{b^2}{a^2}\left(a^2 x - \frac{x^3}{3}\right)$$

and we finally get

$$V = \pi b^2 \times \frac{31}{54.75}a\left(1 - \frac{\left(\frac{31}{54.75}\right)^2}{3}\right)$$

Substituting for b, 31 + for a, 54.75, and reducing, we get $V = 5572.2434$ which is one-half the volume of the chamber. Whence the entire volume is equal to $5572.2434 \times 2 = 11{,}144.4868$ cubic inches.

Allowing 27 cubic inches per pound for the powder, a charge of 300 pounds will occupy a space of 8,100 cubic inches.

The rifled bore is 267 inches in length; hence,

$$\pi R^2 = 3.1416 \times 6^2 = 113.0976$$
$$113.0976 \times 267 = 30197$$
$$30197 + 11144 = 41341$$
$$41341 \div 8100 = 5.1 +$$

volumes of expansion.

This corresponds theoretically to 25,275 foot-tons of *maximum* work capable of being performed by 300 pounds of powder (*vide* Sladen, p. 30).

$$84.25 \times 300 = 25275$$

Here 84.25, taken from the table, represents the work done per pound of powder for 5.1 volumes of expansion.

Three hundred pounds of powder will have an air-space of nearly 37. This will give a moderate pressure and fair velocity. By inserting a *flat* cartridge of 47 pounds beneath the main cartridge, the pressure and velocity will be both increased.

The gun has the capacity of nearly 350 pounds of powder; it will penetrate nearly 40 inches of iron plate, and will, while being safe for the gunners, at the same time be capable of easy maneuvering.

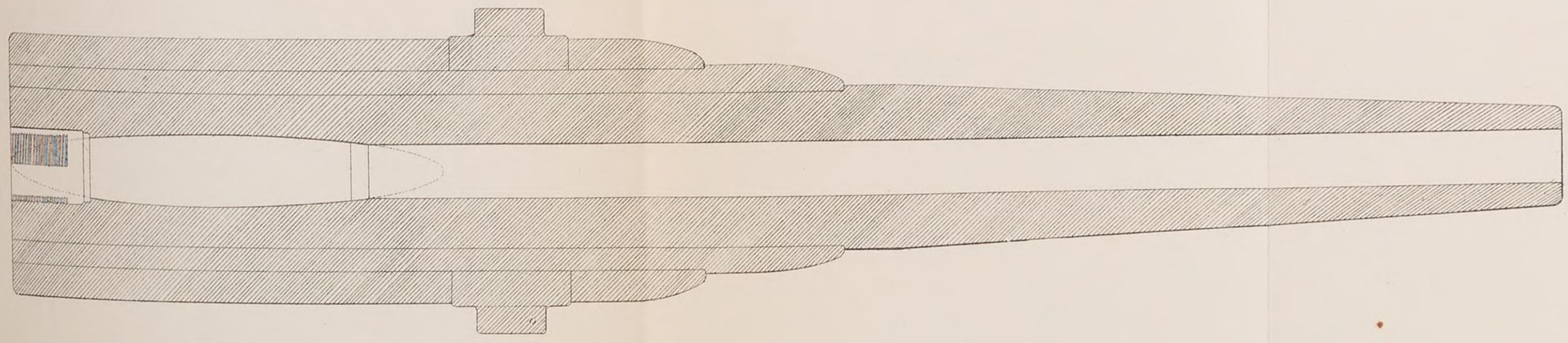
GEO. W. McKEE,
Major of Ordnance.

PROPOSED 12 INCH B. L. WROUGHT IRON RIFLE.

WEIGHT 67 TONS — LENGTH 29 CALS.

ELLIPTICAL CHAMBER

Scale 1/12.



Colonel S. C. Lyford

DR. J. H. MCLEAN.

L. R. No. 223.] OFFICE OF DR. J. H. MCLEAN,
314 *Chestnut Street, Saint Louis, December* 19, 1881.

To the BOARD ON HEAVY ORDNANCE
General George W. Getty, President, *New York:*

Having just returned from our meeting at Boston, where I had the honor of explaining to your Board my system of heavy ordnance, I have concluded that a recapitulation would perhaps be better for reference in your deliberations than the mere verbal explanation that was given you at the South Boston Iron Works. I would first state that I am no cannon manufacturer, and hence it is not necessary to enter into any of the mere details of manufacture, which belong to the foundry or machine-shop, but claim that my system is far in advance of any yet offered for all calibers of fire-arms.

As I explained by the model gun, 1.25-inch caliber, to you, my gun consists essentially of three separate parts, which are also shown in the wooden model transmitted herewith, viz:

First. The breech, marked A, the cavity of which is used to contain a recoil-cushion and firing-pin, the latter working as a direct central fire, which has long been known as far superior to all other. This breech, being long and consequently heavy, is a material aid as an anvil in resisting the recoil.

Second. B is the slide, which contains two cylindrical openings, into which the cartridges are inserted from the front or rear, whichever is found most desirable. I insist upon a steel cartridge shell being used, although copper, brass, or even paper can be used effectually to contain the charge.

The reason steel is better fitted for this purpose is that it will retain a very large amount of the heat of the explosion, and, being quickly ejected as the slide-block is moved to the opposite side, carries with it the heat and gas that are usually left in the chamber, the shell falling into a proper receptacle or on the ground, where it can easily be recovered and reloaded; also, by making these cartridge-shells of sufficient thickness, less metal is necessary in the slide of the gun itself, which would also lessen the cost of manufacture, and save time and labor in handling the gun. The cost of steel shells can be made comparatively small, as they can be made of tubing, and the central tube, that screws into the rear of the shell and goes forward into the projectile, will contain, at its rear end, the primer. This tube in the center of the cartridge was invented by me after the gun shown you was built, and I claim for it that igniting the powder in front instead of the rear by this means secures a more perfect burning of the charge than is now obtained, as under the present system a large amount of unburnt powder s always blown out of the muzzle, and is consequently wasted.

This inner tube, filled with powder, on being exploded by the primer, forces the projectile sufficiently far outward to ignite the charge surrounding the tube from the front and allows full elastic space for the sudden expansion of the gases generated by the burning of the charge, and thus giving the projectile an accelerated initial velocity.* However, my system of guns can use any of the present forms of cartridge, and my new patented cartridge above mentioned is only offered for your consideration.

Third, is the barrel C, which is, as shown, screwed into the breech. In the event of any serious damage to a gun at any point forward of what is known as the "re-enforce," this barrel, screwed into the breech as a separate part, can be replaced at comparatively small cost and delay, whereas with guns such as are now in use the whole is rendered worthless for service by being broken in any part; also, in mounting or placing in position on parapet, casemate, or shipboard, the labor is very much reduced and time saved.

In our examination we merely glanced at the drawings of the 150-ton gun "Hercules," which have been carefully drawn on proper scale and proportion as to size and weights of parts necessary to resist the immense shock consequent upon exploding the large charge demanded to throw a projectile 20 miles. A careful examination of these drawings will show these facts.

The manner of handling the "Hercules" gun will have necessarily to be somewhat modified from those in the small gun shown you, but the principal features of the barrel, breech, and slide are there, and can easily be handled by hydraulic power. There should be a hydraulic engine on each side of the gun, to alternately insert the cartridge and eject the empty shell; another should be placed on top or under that portion of the breech containing the slide, which will move the slide to the right and left as each cartridge is to be brought into firing position. As stated before, the engines for loading and ejecting the empty cartridge-shell can either be placed so as to act from the front or rear of the slide, as I have found by actual experience that the chambers in the slide can be loaded either way with equal facility, with perhaps a difference in favor of loading from the rear. When the cartridge is in front of the barrel, the hydraulic engine, as shown in the drawings, forces the cartridge forward past the junction of the slide and barrel, thus forming a perfect gas-check. When the gun is fired the cartridge-shell is forced back into its place in the slide and against the engine, which thus receives a portion of the recoil.

The drawings of my "Hercules" gun are, I know, far from perfect, but if remodeled by an expert in ordnance draughting, I claim that this gun will prove to be the "boss cannon of the world," having a capacity of from five to ten rounds per minute and a range of from 12 to 20 miles. I will superintend the building of one, and guarantee that it will do everything claimed for it.

The matter of projectiles was not touched upon at our meeting, but I offer for your careful consideration that mentioned above, also my torpedo projectile, described in my Peacemaker book, and hope you will give the same full attention, as I see by the order forming your Board that they are a portion of the matters you are to examine into.

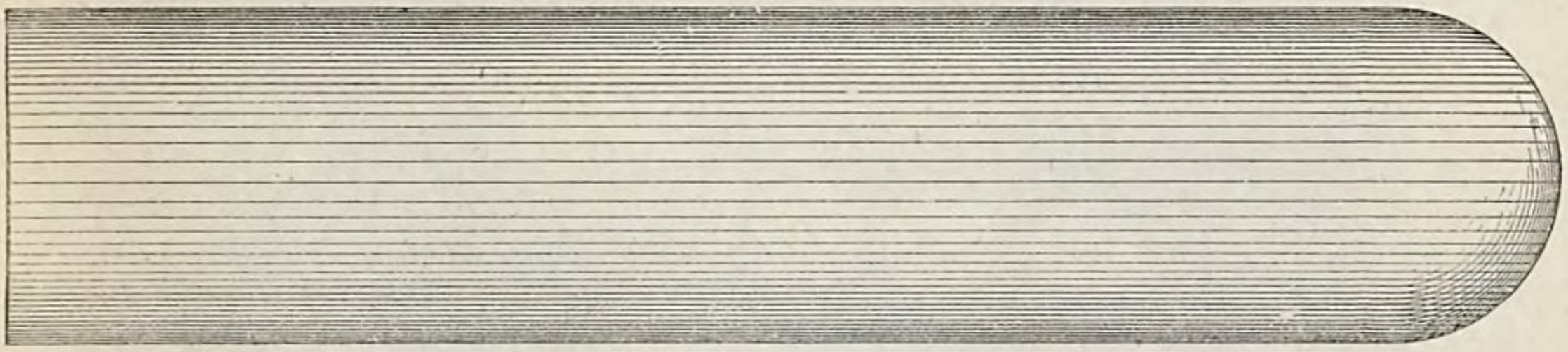
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* "An elastic chamber wanted." See General Simpson on "Ordnance and Naval Gunnery."

(L. R. No. 100.)

DR. J. H. McLEAN'S INCENDIARY TIME SHELL "CYCLONE."

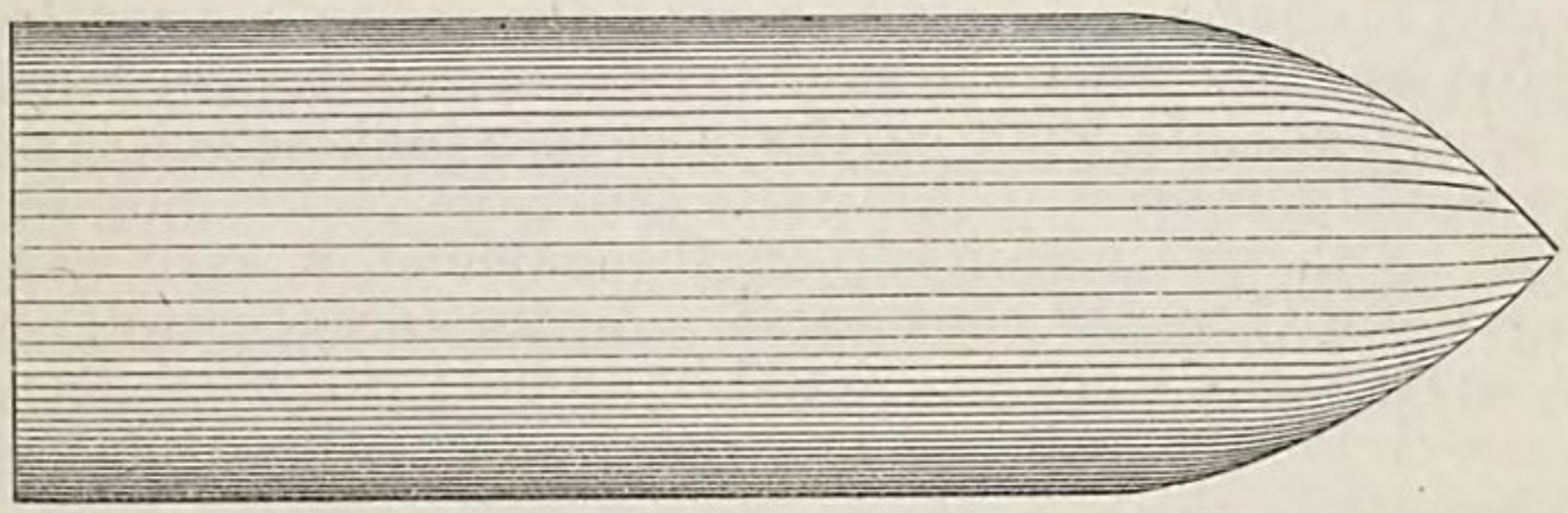
The following illustration shows one of the most destructive shells ever invented:



Dr. J. H. McLean's Incendiary Time Shell "Cyclone."

This is intended to represent a shell large enough for an eight-inch gun. Such a shell would be 8 inches in diameter, and about six diameters in length, or 4 feet. It would weigh, charged and ready to throw, about 350 pounds, and would require a charge of 40 pounds of powder to drive it to a distance of 5 miles. In the interior is a bursting charge of 10 pounds of powder, and a large mass of compressed cotton, saturated with gasoline.

DR. J. H. McLEAN'S TIME SHELL "SURPRISE."



Dr. J. H. McLean's Bomb Shell "Surprise."

This time shell, like the "Cyclone," is furnished with the time-firing mechanism, to be set so as to fire in one second, or in twenty-four hours, or longer, if required, after leaving the gun, and it, like the other, gives no external evidence of being a shell at all.

The claims for superiority which Dr. J. H. McLean urges for this shell *over all others of like caliber* are—

1st. It will never prematurely explode in the gun or near it.

2d. It will explode exactly at the time desired without fail.

3d. It possesses no burning fuse to give warning of its approach or a clew to its character.

4th. It will not be suspected by the enemy of being a shell until it is forever too late to profit by the knowledge of its character.

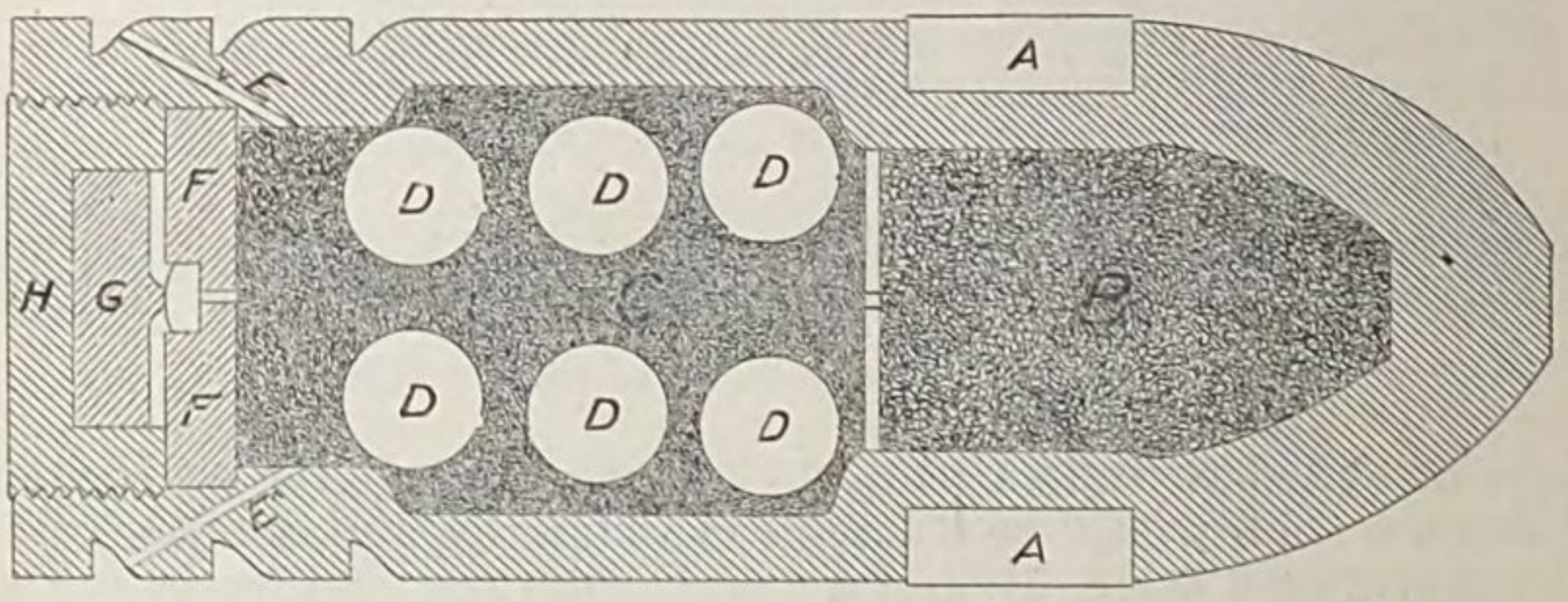
5th. From the fact that its character cannot be known until it explodes, it may be thrown into a fort in large numbers, and set to burst in six hours; would be totally unsuspected by the garison until too late to remedy the fatally misplaced confidence.

These shells can be made from 3 inches in diameter up to any size re-

quired, and answer all the ordinary purposes of solid shot fired from rifled guns first, and would be regarded as such by the enemy until the contrary was cruelly learned.

DR. J. H. McLEAN'S ROCKET SHRAPNEL SHELL.

The following illustration exhibits one of the most admirable shells for destroying earthworks, stampeding cavalry, or general use against a battle-line ever invented.



DR. J. H. McLEAN'S ROCKET SHRAPNEL SHELL.

A—Lead band.
B—Bursting charge.
C—Rocket powder.
D—Shrapnel shot.
E—Vents for the escape of the rocket powder.
F—Metal cap carrying primer.
G—Anvil for exploding the primer.
H—Metal head, screwed into the shell.

The drawing pretty well explains itself, yet, to make the direful character of this shell more clearly apparent, the reader's attention is directed to the fact that when the shell is intended to destroy earthworks it would be driven into such earthworks at a high velocity, say 2,000 feet per second, and upon striking the bank the rocket powder would be exploded by the percussion cap on the hammer F as it was forced against the anvil G by the concussion. As the rocket-powder escaped from the vents E the tendency would be to bury the shell deeper into the earth, and to finally tear a large gap in it, when the exploding charge B was reached.

When firing at cavalry or at a battle-line the velocity of the shell should be low, and it should strike the ground in front of the rank assailed and ricochet to the mark. Upon touching the ground the rocket powder would be ignited, and as it issues in fiery streams from the flying missile horses would take fright and become unmanageable, and finally the shell would burst with a terrific detonation, and its fragments and the shrapnel it contained would create the usual havoc.

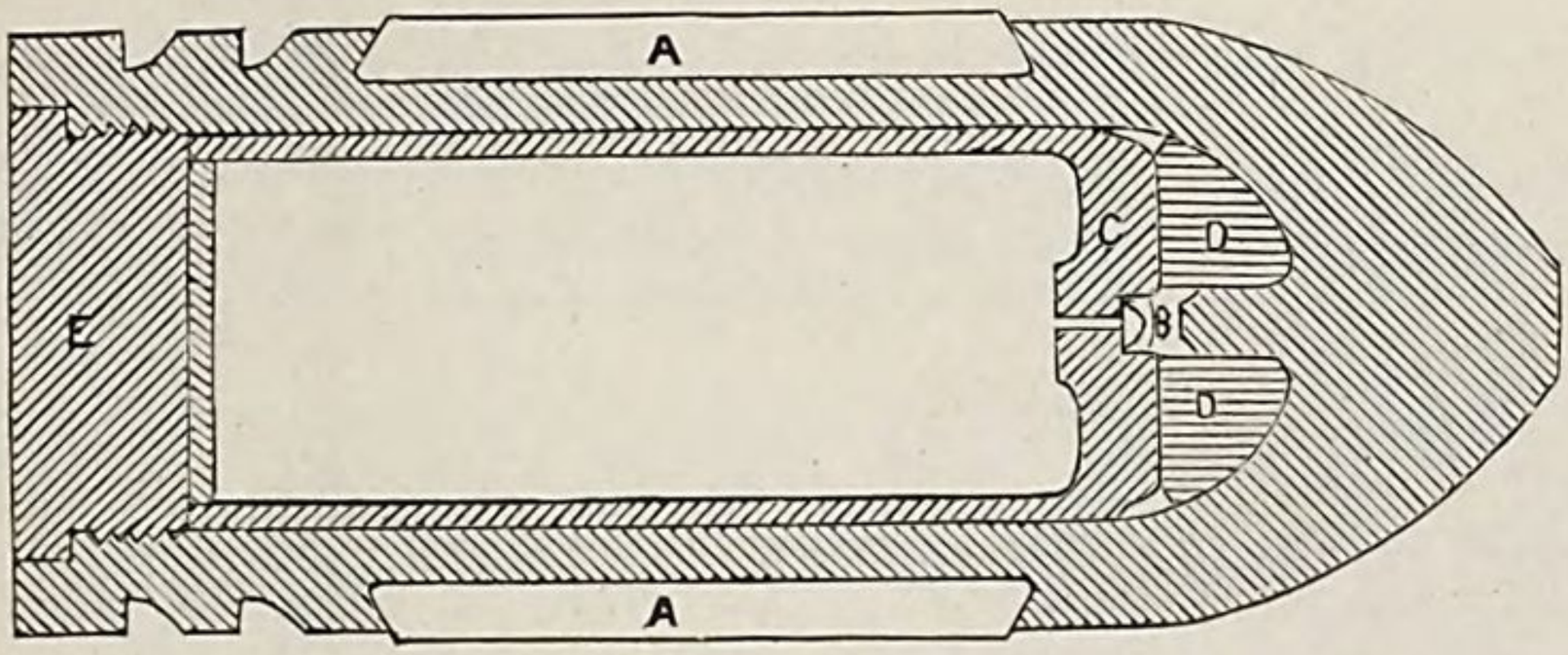
For shelling distant camps this missile will be found exceedingly effective, for if thrown from the gun at a high velocity and proper angle, it will be carried as far as any other projectile of like weight; then, upon touching the earth, the rocket-powder contained in it will be ignited, and a new impulse be given to its flight.

That these will be found to be a most serviceable and effective shell there cannot be the smallest question.

DR. J. H. McLEAN'S PERCUSSION SHELL.

There are situations where percussion shells are very serviceable; so much so that really good ones may be deemed well-nigh indispensable. Admitting this to be so, Dr. J. H. McLean caused a thorough investi-

gation to be made into existing percussion shells, to discover, if possible, their principal defects, and whether these defects could be remedied. The result has enabled Dr. McLean to present to the world a percussion shell perfect in every particular.



DR. J. H. MCLEAN'S PERCUSSION SHELL.

A—Band of lead.
B—Anvil for exploding the primer.
C—Metal tube containing the bursting charge and primer.
D—Rubber cushions to prevent accidental discharge of shell.
E—Metal plug, screwed in to close the shell.

The defects in existing percussion shells are as follows:

1st. Uncertainty in exploding.

2d. Liability to explode if dropped while handling.

3d. Liability to explode when ricochetting on the water.

Dr. McLean claims to have successfully overcome all these objections in the percussion shell which he now presents to the belligerent world.

This shell is provided with the usual percussion primer, hammer, and anvil, but the tube upon which the primer rests is imbedded so deep in a soft rubber cushion that neither the dropping of a shell nor its ricochetting upon the water will fire it. If it strikes the earth at any angle when fired from a gun, it will burst; therefore, in using it against a battle-line, it should be made to strike the ground directly in front of the line, when it would instantly burst, and all of its particles be pitched violently forward into the line.

In shelling cavalry no such need exists, because if the shell strike either horse or man it would explode and scatter its fragments right and left and beyond with deadly effect.

H. F. MANN.

H. F. MANN'S 12-INCH BREECH-LOADING RIFLED GUN.

A brief description of H. F. Mann's improved system of breech-loading rifled ordnance, gas-check metallic cartridge-case, and uniform system of rifling, and projectiles for breech-loading rifled ordnance.

Plate 1 represents several views of a 12-inch rifle. A is the body or barrel of the gun, supposed to be of cast iron, strengthened at the breech around the powder-chamber by a series of wrought-iron or steel bands, properly shrunk upon it. Its rear end has a spheroidal form, having its center in the axis of its trunnions, and center of the bore fitting accurately into the correspondingly concave front surfaces of the breech-block B. The latter may be of cast iron, and is kept in position by a circular recess in its rear surface, into which the projecting front portion of the crosshead C enters.

The crosshead C is of wrought iron or steel, and has through its center a breech-screw, s^1, made of steel or wrought iron. To compensate the expansion of the gun produced by the heat when fired due allowance is made for the necessary play between the crosshead C and the breech-block B. S S are the side straps of wrought iron or steel. They are looped over the trunnions T of the gun, and extend backwards to support the crosshead C, upon which they are attached by mortises and tenons, both ends being secured by means of retaining plates and screws. By this arrangement the barrel of the gun is entirely relieved, when fired, from longitudinal strain, since the latter is transmitted, through the breech-block B, breech-screw *s*, and crosshead C, to the side straps S S, and thence to the trunnions on said straps, upon which the entire gun is mounted upon its carriage, thereby securing for guns constructed upon this system much greater strength and consequent endurance than is possessed by guns of other systems at the same time insuring easy manipulation of the breech-loading mechanism and the greatest possible rapidity in loading and firing.

The barrel or body of the gun is balanced, its trunnions being at or near the center of gravity, and may thus be easily raised or lowered, preparatory to loading and firing; and this is done by means of a special mechanism located in the breech-block B, and taking bearing in the side straps S S. *a* is the crank-shaft of the device, and has two pinions, *e*, which mesh into corresponding racks, *r*, fixed to the spheroidal end of the body.

The shaft *a* is located slightly below the center line of the straps, to secure the proper position of the racks *r*, and to obtain the required angle of elevation previous to entering the charge.

The length of the racks *r* is determined in such a manner that the corresponding grooves *i* in the block B do not reach to the outside, the mechanism being thus fully protected against sand and dust.

A single turn of the crank *g* in the direction of the arrow will bring the barrel from the firing position, Fig. 2, to the loading position, Fig. 1, and *vice versa*.

To regulate the elevation of the barrel while prepared for loading a strap mechanism is attached to the latter and the side straps. It con-

sists of the link *l*, suspended to the lower side of the gun, and the strap *m*, fixed to the side straps S. In the firing position the link is lifted upwards close to the body, Fig. 2; while ready for loading it stands as shown in Fig. 1. To reduce the angle to a minimum the upper edge of breech-block B is cut out in the shape of a circular trough, *n*, Fig. 3, corresponding exactly to the powder-chamber. It also facilitates the introduction of the charge, serving as a guide.

The chamber is concentric with the bore of the gun, and may be but slightly greater in diameter than the bore of the gun itself, measured between the grooves, Figs. 1, 2, and 3, Plate 1, or it may be made as shown in Plate 2.

Its capacity is sufficient to receive the proper charge of powder and projectile. The rifling of the gun consists of 13 grooves and 13 bands of equal width, and of a uniform pitch of one turn in 60 calibers, of the following dimensions:

	Inch.
Width of grooves	1.450
Width of bands	1.450
Depth of grooves $\frac{1}{50}$ of diagram of bore	0.24

The edges of the grooves are rounded at the bottom to a radius of one-half their depth, and the surface of the bands is connected with that of the chamber by a suitable bevel or ramp. (Plate VI.)

The gun is center-firing by means of a vent in the breech-block B, as shown.

The inside opening may be bushed with a copper or platinum disk, inserted in the concave surface of the block.

By reference to the figures of Plate 1 it may be remarked that the breech-straps S are provided with special trunnions T′. They are at or near the center of gravity of the complete gun, and take bearing upon the carriage upon which it is mounted. The whole system can thus be balanced, or the rear part may receive such preponderance as desired.

The mechanism for elevating or depressing the gun may be located below the crosshead C.

A form of gas-checks to be used in this system of breech-loading guns is shown by Plate 5. It is concave-shaped, with a circular flange fitting into the rear of the chamber, and having a central opening to admit the flame from the vent, and may be made of steel, copper, papier-maché, or other suitable material.

The check must be removed before loading and reinserted afterwards, if independent; but it may also be secured permanently to the cartridge case, as will be seen hereafter.

A projectile for a 12-inch rifle is represented on Plate 3. The body is of cast iron or steel, with a front and rear band of suitable soft metal. Its form and construction is plainly shown by the drawing and need no further explanation. Plate 4 contains a new system of metallic cartridge cases, together with their gas-checks. In Figs. 1, 2, 3, and 4 the envelope is formed by four segments of any suitable metal, overlapping at their edges, the latter being soldered or otherwise attached together, so that the strain produced by the fired charge expands the case, causing a separation of the solder along the longitudinal seams, thus collapsing the case and facilitate its easy extraction.

At the rear end each segment is split into several parts and turned inside to close the case, leaving only a central opening, corresponding to that of the gas-check. The latter is fixed upon the case by means of rivets, holding between them a piece of appropriate wire gauze. The case is provided with an air-chamber, *b*, in front of the powder chamber *a*.

The construction represented by Figs. 5 and 6 differs from the former. The longitudinal edges of the segments are turned outside at right angle, thus forming a circular air-chamber around the case, no chamber being in front of the powder. The flanges serve also as guides, to insure the case, with its charge of powder, being centrally located in the chamber.

The loading and operation of the gun is as follows: First, the screw *s'* is loosened by means of the tappet-lever L, on its rear end, and the body caused to revolve around its trunnions T, to assume the position shown by Fig. 1, Plate 1. This is done by means of the cranks *g*. The projectile is now inserted and pushed forward to the rifling, after which the charge follows; then the gas-check, if loose from the cartridge, is put in place, and the movement of the crank reversed. The body is again brought in line with the breech-block, and the screw *s* tightened up by means of its lever L, after which the gun is ready for firing.

H.F. MANN'S 12 INCH B.L. RIFLE.

Plate I.

Fig. 1. Position for Loading.

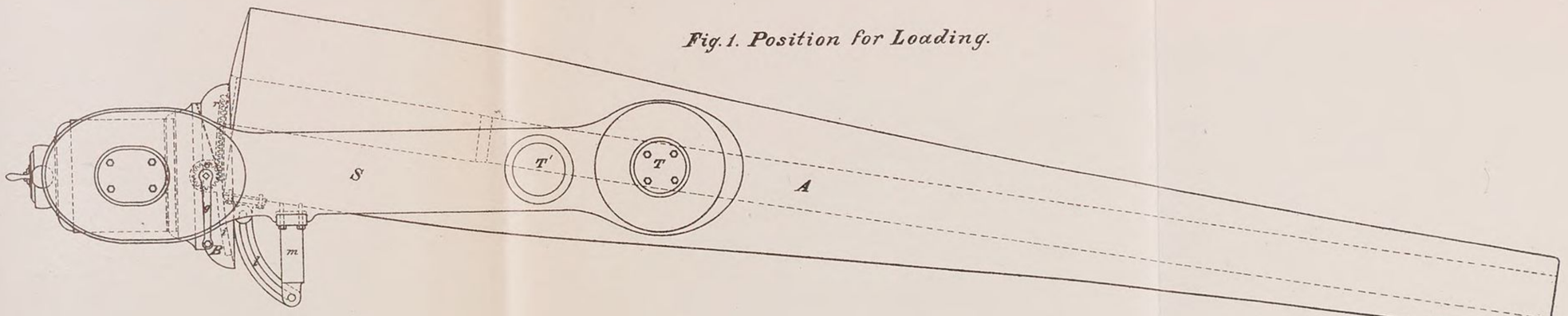


Fig. 2. Position for Firing.

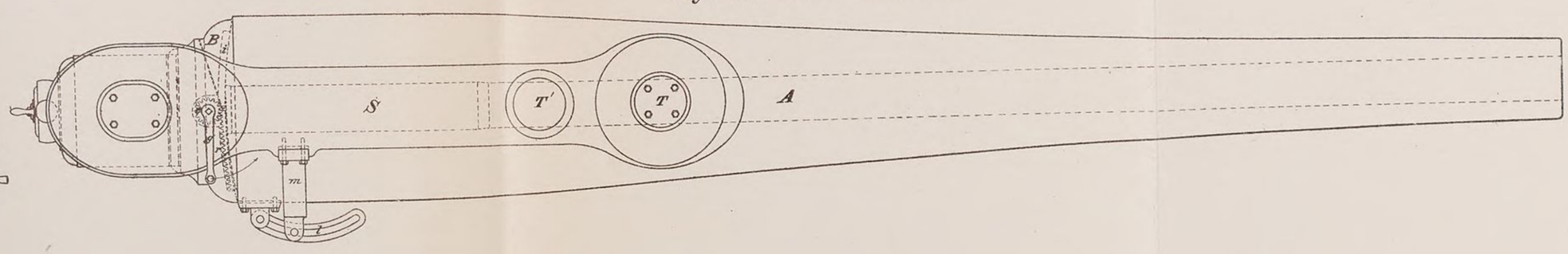


Fig. 3. End View.

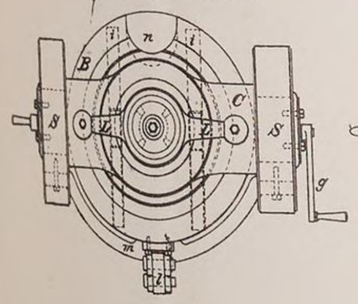
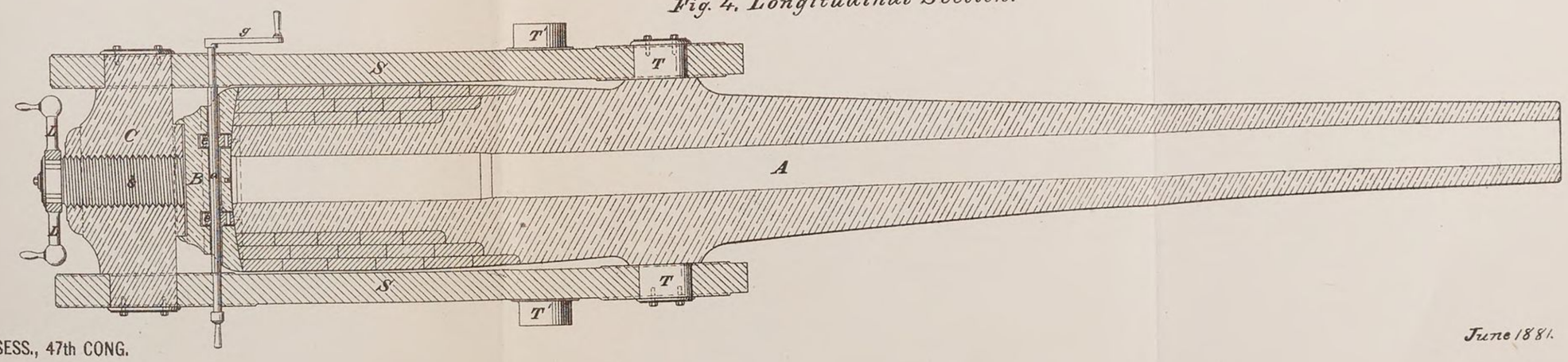


Fig. 4. Longitudinal Section.



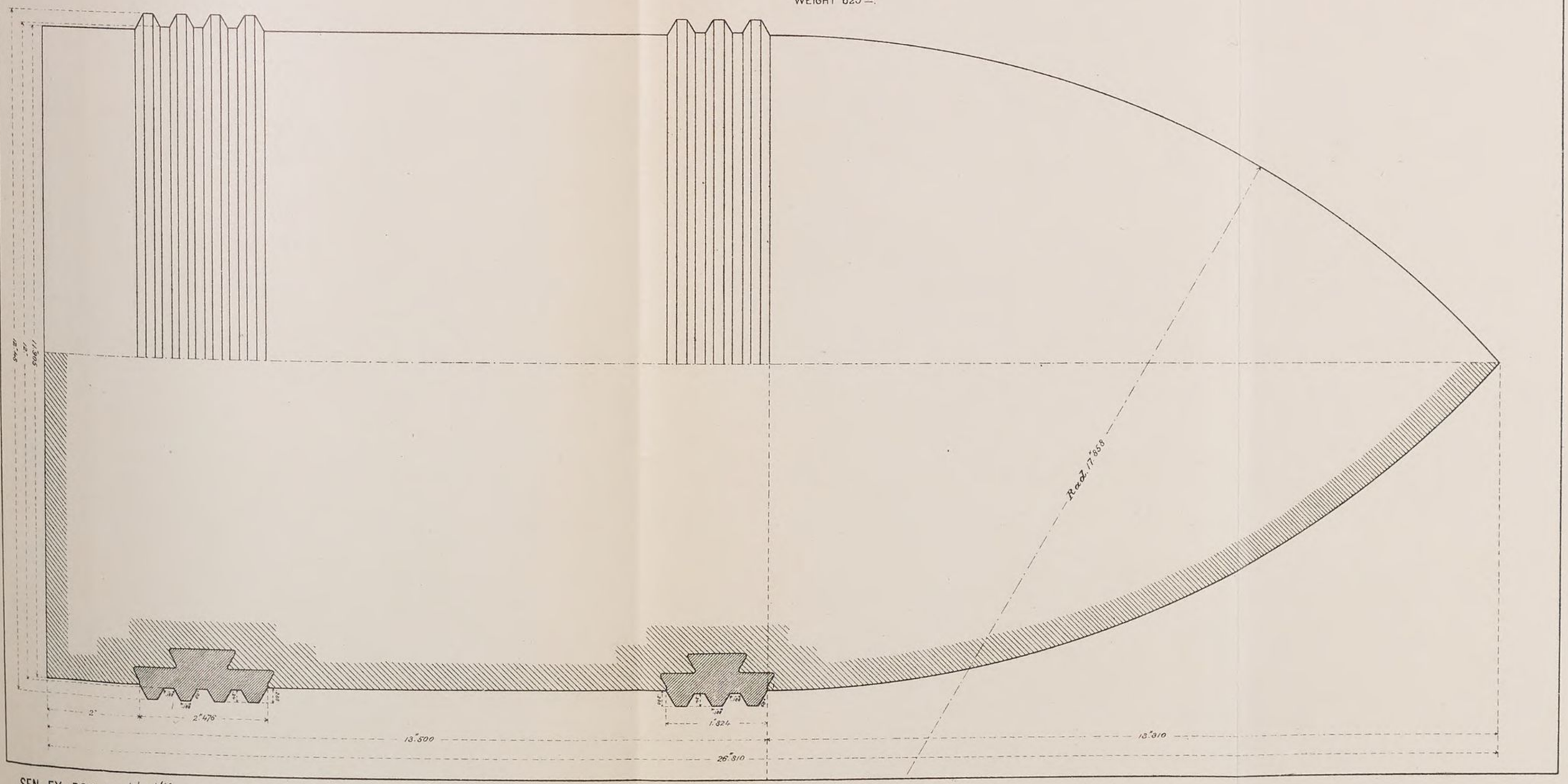
SEN. EX. DOC. No. 178, 1st SESS., 47th CONG.

June 1881.

PROJECTILE FOR H.F. MANN'S 12 INCH B.L. RIFLE.

Plate III.

WEIGHT 625 LBS.



SEN. EX. DOC. No. 118 pt 2, 1st SESS., 47th CONG.

LIEUT. C. C. MORRISON.

L. R. No. 264.] NATIONAL ARMORY,
Springfield, Mass., April 9, 1882.

THE PRESIDENT OF THE BOARD ON HEAVY ORDNANCE:

SIR: I have the honor to submit for the consideration of the Board convened per General Order No. 48, May 16, 1881, War Department, the following plan of constructing a 12-inch caliber gun, or, on the same principle, rifled guns of other calibers.

It is proposed to wrap about a steel tube ribbons of steel and thin brass, the brass to encompass the steel on one side and the two edges, and to act eventually as a means of soldering the whole together.

These ribbons should be wrapped at an angle of about 18°, in order that there may be the due proportion of their strength contributed to resist the longitudinal strain.* To assist in this purpose, bars of rolled cast steel are to be placed in juxtaposition, as staves about the breech of the gun, running from a ring in front of the trunnions parallel to the bore, and hooked in front over a shoulder of the wrapped metal, and in rear over a breech-ring, which ring, after the ribbons are wrapped on the tube, is screwed upon the end of the latter, so as to abut against the former.

It is proposed to shrink upon these longitudinal bars from the rear a set of cast-steel rings, 1½ to 2 inches thick, to be turned down, after brazing, to 1 inch. In front of these rings a heavy cast-steel ring is then to be screwed upon the bars.

The portion of the gun in front of this last ring is then wrapped to a size slightly larger than its finished dimensions. Between the staves and rings, and in all other joints between the steel surfaces, thin sheet-brass is to be placed.

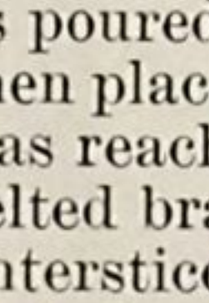
The body of the gun thus far constructed is then to be placed in a boiler-iron case or pot, made as nearly tight as possible, to prevent the brass, afterwards poured in, from leaking.

The whole is then placed in a furnace, breech down, and heated slowly until the whole has reached a brazing heat. The fire will then be drawn and sufficient melted brass poured in to make a bath for the gun, and thus fill up the interstices that may remain.

The gun, cooled from the interior, will then be turned down, and heavy cast-steel rings shrunk from the rear upon it, the forward one carrying the trunnions; after which the finish-boring, turning, and rifling will be done.

To prevent the brass bath from leaking through the joints of the boiler-iron as the case fills, and following the brass up, a rose of water

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*Tendency to rupture from the tangential strains being represented by $\frac{3p}{2s}$, and from the longitudinal $\frac{p}{2s}$, then should the component of the tensile strength of the material in the direction perpendicular to the axis of the bore be three times that parallel to it. In the figure 

$a\ c$ being the tensile strength, $a\ b$ will be equal to $3\ a\ d$ when $b\ a\ c = 18°\ 26'$ approximately.

to chill it, the case below the melting point of brass, should be introduced through holes provided for the purpose.

To insure perfect brazing the metal should be freed from rust or scale, and then given a bath in a boiling supersaturated solution of borax.

The following experiments have been made, among others, bearing on the subject:

Bright steel, after receiving a bath of such solution of borax, was allowed to stand several months in an ordinarily dry place. Upon brushing the white deposit of borax from the same at the end of that time, the metal was found perfectly bright and free from rust. Two pieces of steel, after being on hand several years, were, without cleaning, dipped in borax solution, then oiled, and, without wiping, brazed.

It is proposed to make the ribbons of steel .75 inch wide, and as thick as it can be wrapped with the power available, probably from two to three tenths of an inch. The steel should have as high an elastic limit and ultimate strength as possible to be wrapped. The tube and rings should be of compressed or good hammered cast steel. No wrought iron nor very low decarbonized steel should be used. The brass need not be more than .005 of an inch thick.

To more fully illustrate the method proposed, I have the honor to submit herewith a drawing of a proposed 12-inch gun on this plan. A, in the drawing, represents the steel breech plug; B, the steel tube; C, the steel breech ring; D, the wrapped metal; E, the bars for longitudinal strain; G, cast-steel rings shrunk upon the bars; J, cast-steel ring screwed upon the bars; all of which are to be brazed together. H, i, and F are cast-steel rings shrunk on after the gun is brazed, the ring I bearing the trunnions. The chamber is powder-spaced for 300 pounds of powder, 35 cubic inches to the pound. All corners in the steel should be filled as represented, to avoid planes of weakness.

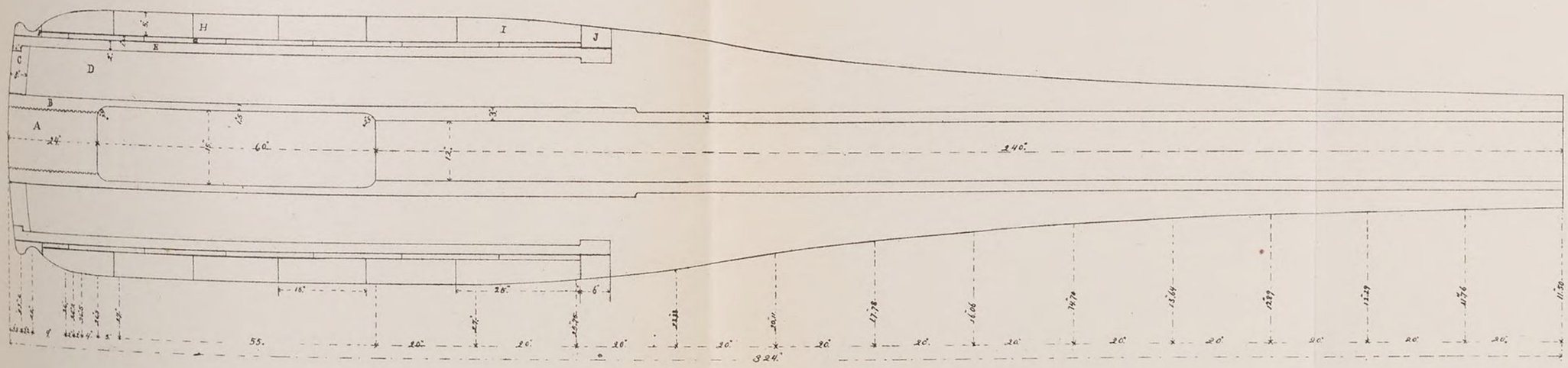
Principal dimensions.

Total length of gun	inches	324
Length of steel tube	do	324
Length of bore	do	300
Length of chamber	do	60
Diameter of bore across lands	do	12
Diameter of chamber	do	15
Diameter at muzzle	do	23
Maximum diamater	do	54
Diameter of trunnions	do	15
Diameter of rim bases	do	17
Pitch of rifling (uniform twist)	feet	70
Number of grooves		70
Width of grooves	inches	.2696
Charge of powder	pounds	300
Weight of shot	do	700 to 800

If it be desirable to make a breech-loader, the French fermeture could easily be adapted to the gun.

Very respectfully, your obedient servant,

CHARLES C. MORRISON,
Lieutenant of Ordnance.



SEN. EX. DOC. No. 178 pt 2, 1st SESS., 47th CONG.

* 12" Rifles proposed by Charles C. Brownson Lieutenant of Ordnance

THE CHIEF OF ORDNANCE.

L. R. No. 226.] ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, January 17, 1882.

General GEORGE W. GETTY,
President Board on Heavy Ordnance, &c.:

SIR: I have the honor to transmit herewith, for the consideration of your Board, plans of a 12-inch B. L. rifle on the French and on the Italian system of construction, with a letter of explanation, prepared by Capt. Charles S. Smith, Ordnance Department, in obedience to my instructions.

The French system, as proved by actual experience abroad, is a sound and good one; and on either its present or original form, *i. e.*, without an interior tube, is to-day almost universally the adopted system in every state of Europe where cast iron enters largely into the manufacture of heavy guns. Although the French are now making all-steel guns, yet the lack of the necessary facilities for such construction, on a scale commensurate with the requirements both of the defense of the coast and of the armament of the Navy, forces them to a continuation of this combination of cast iron and steel.

The Italian system was, at its inception, based upon the French; that system having been selected by the Minister of War as the type to be followed by the Heavy Artillery Commission in 1867, in their endeavors to establish a more powerful artillery than was practicable with the existing systems of that day.

The rejection by this Department of the steel breech receivers for the 12-inch rifles under contract as not up to standard, and the known difficulties of procuring such large masses may necessitate modifications in the plans and construction of these guns.

The law under which your Board is now acting requires that you report on the "guns now being constructed and converted under direction of the Ordnance Bureau," and it appears to me proper to submit these papers and reports for your consideration in that connection.

As bearing directly on the subject of our gun construction, I have the honor to transmit an interesting report of Lieut. C. W. Whipple, Ordnance Department, on the steel manufacturing facilities in this country. It is hardly necessary to say that the extended experience of other countries leaves no room for doubt that in the interest of the national defense the production of steel for gun construction should be encouraged and fostered.

Respectfully, your obedient servant,

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, December 3, 1881.

Capt. C. S. SMITH,
Assistant to Constructor of Ordnance, New York:

SIR: You will please, at your earliest convenience, prepare plans of the French system of fermeture applied to one of the 12-inch rifles now under contract.

It is my desire to submit them to the Board on Heavy Ordnance and

Projectiles now in session in New York, and you will please forward the plans to me through the Ordnance Board.

Respectfully, your obedient servant,

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

NEW YORK CITY, *December* 30, 1881.

The CHIEF OF ORDNANCE, U. S. A.,
Washington, D. C.:
(Through the Ordnance Board, U. S. A.)

SIR: Herewith I have the honor to submit plans marked, respectively, $\frac{A}{1}, \frac{A}{2}, \frac{A}{3}, \frac{B}{1}, \frac{B}{2}, \frac{C}{1}, \frac{C}{2}, \frac{D}{1}, \frac{D}{2}$, of the French system of fermeture applied to one of the 12-inch rifles now under contract, agreeably to your instructions of the 3d instant.

It being understood, from a conversation had previously with you, that the mode of construction of the gun itself, as contemplated under the existing contract, was not necessarily to be adhered to in these plans, I have prepared, or have now in course of preparation, several distinct plans, embracing in all the feature of the French fermeture, but applying it, in the several cases, to different systems of gun construction, as follows:

I. A cast-iron body, tubed and hooped with steel, analagous to the French gun. Plans $\frac{A}{1}, \frac{A}{2}, \frac{A}{3}, \frac{B}{1}, \frac{B}{2}, \frac{C}{1}, \frac{C}{2}$;

II. A cast-iron body, hooped with steel, analagous to the Italian gun. Plans $\frac{D}{1}, \frac{D}{2}$; and

III. A cast-iron body, tubed with steel, or with steel and wrought iron, analagous, in a measure, to the original plan of the 12-inch rifles now under contract. The latter plans are not as yet completed, and accordingly are not among the inclosures of this letter.

There are submitted three plans on the first system, differing from one another, chiefly—but not largely—in dimensions and weight; but either one of them is a *heavy* gun; weightiness being a distinctive feature of that mode of construction. An all-steel gun, of anything near a like weight, say 58 tons, would fire a charge of 460 pounds of powder with a projectile of 925 pounds. As in a gun built-up on the French system the lining tube is essentially a thin one, a difficulty is experienced at the outset—where it is desired to create a large chamber—in securing a diameter sufficiently large, in order not to entail too great a length upon the cartridge, and yet, at the same time, not *so* large as to reduce too much the thickness of the walls of the tube.

These considerations have necessitated the employment of as thick a tube as the conditions of the case would admit of, while the thickness over the chamber has been reduced to what was deemed the lowest safe minimum. By the employment of denser powders, such as are used in France, it may be found practicable to increase considerably the density of loading above the limit assigned for this gun, in which case the tube could be better proportioned.

It is generally conceded that there is a useful gain in increasing the thickness of the walls of a gun up to a thickness of a caliber and a half, but in chambered guns, where the chamber is contracted at both ends,

giving at these points a greater thickness of metal in the walls, it is thought, and this idea has governed in the preparation of these plans, that the above rule may be, in a measure, departed from, and particularly as it will more than obtain over the seat of the projectile, where the strains upon the walls are the most severe.

In the construction of the French guns, the relative thickness of the tube, cast-iron body, and frettes are approximately as follows, expressed in calibers:

	Caliber.
Thickness of tube	$\frac{1}{4}$
Thickness of cast-iron body	$\frac{3}{4}$
Thickness of frettes	$\frac{1}{2}$
Total	1.5

The above proportions have been followed as closely as practicable, assuming the caliber of the chamber at 14.5 inches, instead of 15 inches.

The greater the thickness of the hoops up to 93 per cent. of the caliber, and of the tube up to 32 per cent. of the caliber, the thickness of the cast-iron being reduced correspondingly, the more nearly are the theoretical conditions of maximum resistance complied with. But pushing the construction too far in this direction, would be to leave out of view economy in the use of steel; and furthermore the rigorous theoretical construction is not practically admissible, since cast iron can only be employed to advantage under a considerable thickness, particularly as here, where it serves as the gun body, uniting the several other parts and sustaining the breech-block.

The thickness of the two tiers of hoops has been determined from the principle that where the metals have the same elastic resistance, the thickness should increase from the interior to the exterior in a geometrical progression. The curve of pressures has been taken from English sources, and is fairly applicable to our powders.

The factors of safety, the ratio in which the ultimate strength of the gun exceeds the powder pressures to which it is subjected, have been determined by the formulas of General Virgile for the resistance of cannon, taking a mean of the results furnished by the general formula, and that applicable to the particular case where the metal is assumed to work equally throughout its thickness, as where perfect interior cooling has been attained, for the resistance offered by the cast-iron body. The resistance of the gun as above calculated is about 33 per cent. less than as calculated by the rule employed by the Woolwich authorities. The shrinkage to be employed in assembling the several parts of the gun would be calculated by the usual formulas, notably those of General Virgile.

Referring to Plan $\frac{C}{1}$, which is the lightest gun of this system, we have the following data for the 15-inch chamber:

	Sq. inches
Area of cast iron in cross-section over chamber (a)	1,072
Area of cross section of chamber (b)	177

Ratio $\frac{a}{b}$, 6.0.

Area of tube in cross-section over chamber	170
Area of cast iron in cross-section over base of tube	908
(c)	1,078

Ratio $\frac{c}{b}$, 6.0.

without taking into account the relative tenacities of steel and cast iron.

In the French 27^{c} and 32^{c} guns, the ratio $\frac{a}{b}$ is 6.1 and 6.7, and $\frac{c}{b}$ is 5.8 and 7.1 respectively.

In Plan $\frac{A}{3}$ the thickness of the tube over the chamber has been increased and the exterior diameter of the forward part reduced, with the formation of a shoulder to admit of this modification. Such a construction is open, however, to the objection that, as the tube is inserted under shrinkage, it will scarcely be practicable to obtain a close fit between the corresponding shoulders of the tube and cast-iron body; and further, it increases the labor of fabrication. In this plan the area of cast iron in the cross section over chamber is about the same as in $\frac{C}{1}$.

The Plans $\frac{D}{1}$ and $\frac{D}{2}$ are projected on a similar system of construction to that formerly employed in France, and which is to-day the adopted system in Italy. It was ascertained by actual trial in France that, when such a gun gives way, rupture takes place transversely, commencing on the interior of the gun along the first thread of the breech-screw. By the employment of a short steel tube, inserted in the gun under shrinkage, the resistance of the gun to transverse rupture was proved to be greatly increased.

The shrinkage exerts an effort of compression over the body of the tube, holding the latter so firmly in place that *déculassement* can take place only by rupturing both steel and cast iron. In Italy, however, the system has been subjected to some severe tests, with good results; due in part, no doubt, to the excellent quality of the Italian cast iron. The Italians have actually under trial a 46^{c} gun of this system of about 100 tons weight. From the point of view of facility of fabrication, the system presents the feature of great simplicity. The contracted form of the bottom of the chamber, as shown in the plans, may exercise a modifying influence upon the strains thrown upon the metal along the first thread of the breech-screw. Under firing, the walls of the bore are dilated by the pressure of the powder-gas, and this dilatation would extend, did no force act to prevent it, to some distance beyond the obturator-plate. But the thread on the breech-block *does* act to resist it, thus giving rise to a severe strain upon the nut, along the bottom of the first thread. It is clear that this strain should increase as the dilatation is greater. Now, the lesser diameter at the bottom of the chamber, and the greater thickness of the walls there, should act to diminish the dilatation at that point, and therefore beyond it, at the position of the first thread.

The results of the trials of this system in Italy, established the fact that, while the gun gave way by transversal rupture along the bottom of the first thread, yet such rupture was preceded by certain well defined indications along the surface of the cast iron, by heeding which explosive bursting would be avoided.

In connection with the very large charges employed in the chambered guns of to-day, a new cause greatly affecting the endurance of cannon has appeared. The limit of serviceableness of the French 27^{c} (10$''$ 63) gun, when firing the ordinary battering charge of 92 pounds, and projectile of 475 pounds, was established by ministerial decree at 400 rounds. But after the gun had been chambered so as to admit of firing a charge of 142 pounds, it was found to be unserviceable at the end of 250 rounds

by reason of the erosions produced in the bore, and which destroyed the rifling. If this cause then should not act equally in the French and in the Italian systems to render the gun unserviceable, before the time for transverse rupture, there would seem to be no valid objection to the Italian system; and in the absence of any data on this point, such a gun might be advantageously tested side by side with a gun on the French system.

In the construction of the Italian gun, the relative thickness of the cast-iron body and the steel frettes, expressed in calibers, are as follows:

	24c (9″, 448).	32c (12″, 598).	46c (18″, 11).
Thickness:			
Cast-iron body	0.987	0.919	0.858
Steel frettes	0.541	0.572	0.639
Total thickness	1.528	1.491	1.497

Plan $\frac{D}{1}$ is based on a caliber of 14 inches, and the thicknesses are for the cast iron, one caliber, and for the hoops one-half caliber, so that the thickness of the steel hoops might be yet increased somewhat with advantage.

Referring again to Plan $\frac{D}{1}$, we have the following data for the 15-inch chamber:

	Square inches.
Area of cast iron in cross-section over chamber (a)	1,080
Area of cross-section of chamber (b)	177
Ratio $\frac{a}{b}$, 6.1	

In the Italian 32c, the ratio $\frac{a}{b}$ is 6.5; in the 46c, it is only 5.1. The hoops in those guns were applied with a shrinkage equal to their elastic extension.

It is believed that steel hoops of the requisite quality could be produced at some of the steel-works in this country—at no distant day, if not at once, and if a hooped gun is approved of for fabrication it is respectfully recommended that some trial hoops be procured from steel-works here, as Midvale or Nashua, possessed of rolls for making wheel tires, and subjected to the mechanical tests employed in France for proving frettes.

In the French gun, the steel tube, at least for a first gun, would preferably be of Whitworth's fluid pressed steel; though in France Bessemer steel has been used for this purpose.

I append hereto, a note on the method of proving steel frettes in France (Appendix I), a tabular statement showing what it is deemed should be the physical properties of the component parts of guns made on the inclosed plans (Appendix II), and an estimate of the cost of the different guns, on the plans herewith submitted, based on the cost of the 12-inch B. L. rifles now under contract (Appendix III).

Very respectfully, your obedient servant,

CHAS. S. SMITH,

Captain of Ordnance, Assistant to Constructor of Ordnance.

APPENDIX I.

METHOD OF PROVING STEEL FRETTES IN FRANCE.

Proof of elasticity.—The frettes should sustain a shrinkage of $\frac{1.75}{1000}$ of the diameter; and the trunnion band of $\frac{1.5}{1000}$, without sensible enlargement. They are accordingly placed *hot* on a hollow cast-iron cylinder of the proper diameter, which, after a lapse of 48 hours, is removed by being destroyed.

The frettes should show no increase in diameter. In the *proof of resistance*, the shrinkage is $\frac{3.5}{1000}$ and $\frac{3}{1000}$ respectively for the hoops and the trunnion band. The frettes should not break under this proof, nor should any apparent defects become sensibly augmented. Frettes subjected to this proof are not, of course, to be afterwards employed for the hooping of guns.

APPENDIX II.

12-INCH BREECH-LOADING RIFLE.

[French system.]

	Physical properties of component parts.			
	Elastic limit.	Ultimate resistance.	Elastic extension.	Ultimate extension.
			Per cent.	*Per cent.*
Inside tube	35,000 to 42,000	78,000 to 85,000	.20 to .26	15 to 20
Frettes	45,000 to 52,000	85,000 to 95,000	.15 to .18	8 to 14
Cast-iron body	11,000	32,000 to 37,000	.05	30 to 60

APPENDIX III.

Mark.	Weight of steel.	Weight of cast-iron.	Total weight of guns.	Cost based on cost of 12-inch B. L. rifles now under contract.
	Pounds.	*Pounds.*	*Pounds.*	
A 1	62,222	80,554	142,776	$48,861
A 3	61,563	81,254	142,817	48,867
B 1	59,295	78,473	137,768	47,145
C 1	58,886	77,597	136,483	46,701
D 1	54,140	79,192	133,332	45,583

[First indorsement.]

THE ORDNANCE BOARD, U. S. A.,
New York, January 9, 1882.

Respectfully forwarded to the Chief of Ordnance, United States Army.

The Board, in its action on the letter of the Chief of Ordnance of November 16, 1881, calling its attention to "the advisability of testing the

French fermeture, and also of applying it to one of the four 12-inch guns under contract," resolved as follows:

That the Board is decidedly of opinion that the French system of fermeture for heavy ordnance should be tested by the Department, and would suggest that plans for this construction be prepared for application to one of the new 12 inch rifles now under contract, and would recommend that as soon as these plans are completed they be submitted to the Board on Heavy Ordnance and Projectiles.

The within communications and accompanying plates, submitted by Capt. Charles S. Smith, meet with the unanimous approval of the Board. The plates show clearly the French and Italian systems of gun construction as applied to a cast-iron body, but little different in size from the one contemplated under the present contract for the four 12-inch rifles, adding but little to the cost of this portion of the gun. The Board concurs with Captain Smith in recommending that the tube for the first be of Whitworth's fluid compressed steel, and this should be taken as the standard for our manufacturers to work up to in future constructions of this character.

While the Board expresses a preference for the construction marked $\frac{A}{1}$, it is of the opinion that any of the plans submitted would make a good construction, and that Captain Smith deserves great credit for the designs he has so carefully prepared and presented.

The Board will further add that inasmuch as the steel receivers of the quality required for constructing the four 12-inch rifles now under contract cannot be procured, it is of the opinion that whatever plan may be adopted should, if it be necessary under the law to make these rifles, be applied to all of them.

The valuable contribution of Lieutenant Whipple, which is submitted by Captain Smith, has also been considered. The Board would recommend, in connection with it, that an effort be made by the department to ascertain how many of the American manufacturers mentioned having the necessary plant will undertake to furnish the frettes required for such construction as may be adopted. It would recommend further, if frettes can be obtained, that first, as recommended by Captain Smith, two at least be ordered for trial and subjected to mechanical tests to be hereafter prescribed, which tests, if found satisfactory, may establish a standard for future comparison.

For the Board.

T. G. BAYLOR,
Lieutenant-Colonel of Ordnance, President of the Board.

NEW YORK CITY, *December* 31, 1881.

The CHIEF OF ORDNANCE, U. S. A.,
Washington, D. C.:
(Through the Ordnance Board, U. S. A.)

SIR: Herewith I have the honor to submit, as an addendum to my letter of the 30th instant, a paper prepared by Lieut. C. W. Whipple, Ordnance Department, U. S. A., regarding the various modes employed for the fabrication of steel hoops for cannon; also some data on the steel and steel works of this country.

Very respectfully, your obedient servant,

CHAS. S. SMITH,
Captain of Ordnance, Assistant to Constructor of Ordnance.

[First indorsement.]

THE ORDNANCE BOARD, U. S. A.,
New York, January 9, 1882.

Respectfully forwarded to the Chief of Ordnance, United States Army, inviting attention to first indorsement on Captain Smith's letter of December 30, 1881, inclosed herewith.

For the Board.

T. G. BAYLOR,
Lieutenant-Colonel of Ordnance, President of the Board.

WEST POINT FOUNDRY,
Cold Spring, N. Y., December 29, 1881.

Capt. CHARLES S. SMITH,
Ordnance Department U. S. A., New York City:

CAPTAIN: I have the honor to submit to you the following report on the subject of steel for gun constructions (a report which I propose to supplement more fully later), with a view of assisting you in ascertaining whether steel of suitable quality for the purpose could be made in this country, and what establishments it would be advisable to encourage in the undertaking.

The drawing of the 12-inch breech-loading rifle, recently sent to me for calculation of weights, which represented a cast-iron casing partially lined with a steel tube and strengthened in rear by two layers of steel frettes, has been assumed by me as the measure of the work to be accomplished. The tube for this gun weighs 10,500 pounds, finished, while none of the frettes exceed 3,000 pounds.

Disregarding for the present the kind of steel to be used, my inquiries have been made with a view of determining two facts: First, the furnace capacity of the different establishments or their ability to produce ingots of the proper weight for tubes and frettes; second, their conveniences for hammering and shaping them.

With these ends in view I have collected, from various sources, the following list of some of the principal steel manufactories of the country:

Name.	Place.	Process employed.
Vulcan Steel Works	Saint Louis, Mo	Bessemer.
Schoenber Bros	Pittsburgh, Pa	
Edgar Thompson	do	Bessemer.
Joliet Steel Company	Joliet, Ill	
North Chicago Steel Company	Chicago, Ill	
Otis Steel Company	Cleveland, Ohio	Open hearth.
Scranton Steel Company	Scranton, Pa	
Lackawanna Iron and Coal Company	do	Bessemer and open hearth.
Albany and Rensselaer Iron and Steel Company	Troy, N. Y	Bessemer.
Bethlehem Iron Company	Bethlehem, Pa	
Nashua Steel Company	Nashua, N. H	Open heath.
Bridgewater Steel Works	Bridgewater, Mass	Naylor steel.
Midvale Steel Works	Nicetown, Pa	Open hearth and crucible.
New Jersey Steel Company	Trenton, N. J	
Chrome Steel Company	Brooklyn, N. Y	
Philadelphia and Reading Coal and Iron Company	Reading, Pa	Bessemer.
Pennsylvania Steel Company		Do.
Cambria Steel Works	Johnstown, Pa	Bessemer.
Pittsburgh Bessemer Steel Company	Pittsburgh, Pa	Do.
Park Bros. & Co	do	Open hearth and crucible.
Naylor & Co., Norway Iron and Steel Works	Boston, Mass	Open hearth.

Of these establishments the Midvale, Nashua, and Norway Iron and Steel Works (Naylor & Co.) have alone, within my knowledge, made steel for gun constructions, and that on a limited scale.

The Midvale Steel Works have supplied to the Army the small ingots used in converting the 3-inch wrought-iron field guns into breech-loaders, and to the Navy the tubes used in the conversion of their Parrott guns. They have also, recently, made the tube for the new 6-inch Lyman multi-charge gun. This tube is 23 feet long, 10½ and 11½ inches diameter, and weighs 8,670 pounds. Appended to this report and marked A are the records of the tests which were made in the case of the latter, and the 80-pounder conversions. Appended and marked B is the record of the tests of the steel made by Naylor & Co. for the 60-pounder Navy converted rifles. This steel was hammered, and not very thoroughly, at the Washington navy-yard, where the hammer (single action) weighs 16,500 pounds.

Of the establishments before mentioned, and excluding the Bessemer works, those most likely to succeed in the production of suitable steel, and which, I think, would undertake to make both tubes and frettes, were such required, are as follows:

1st. Park Bros. & Co., of Pittsburgh, who have sent me the following information: They make crucible and open-hearth steel, of the former their capacity being 90 tons per day, and of the latter 40 tons. Their hammer weighs 17 tons, but with the steam is computed at 67 tons. They have never tempered in oil; and they are willing to undertake to make forgings for ordnance constructions.

2d. The Nashua Steel Works, visited by you in July, 1879. From your report then made, I find its condition was then as follows: They make open-hearth steel, their furnace having a capacity of 12 tons, while preliminary arrangements had been made for the erection of two more furnaces of like capacity, which, being under the same roof, could presumably be used together. Their heaviest hammer, which is "double action," weighs 12 tons (making its total capacity probably 25 tons). No arrangement for tempering in oil exists, but could be readily provided. The establishment desires to undertake to make steel for ordnance constructions, as applied to the 8-inch breech-loading rifle (then under discussion), and express confidence of success.

3d. The Bridgewater Steel Works, of Bridgewater, Mass. They use Naylor's steel (open-hearth), and their heaviest hammer, which is double action, weighs 17 tons.

4th. Midvale Steel Works, visited by me in March, 1879. Its condition as shown in my report was then as follows: They make open-hearth, and, to a limited extent, crucible steel. Their largest open-hearth furnace has a capacity of 30,000 pounds, and a smaller furnace a capacity of 5 tons. Their heaviest hammer, which is "double action," weighs 7 tons, which they consider capable of hammering the heaviest ingot they can obtain from their large furnace. They have arrangements for tempering in oil; are desirous of attempting the fabrication of steel for ordnance purposes, within the capacity of their works, and are disposed to favor the Terre Noir process of manufacture, by which forging under the hammer is dispensed with.

5th. The Otis Steel Company, of Cleveland, Ohio; the Scranton Steel Company, and Lackawanna Iron and Coal Company, both of Scranton, Pa., and the North Chicago Steel Company, all have the reputation of producing good open-hearth steel.

As regards the forging of the inner lining tube, in your report of July 21, 1879, to the constructor of ordnance on the Nashua Steel Works, you

state that, "in Russia, for working ingots of from 12.5 tons to 40 tons, a 50-ton hammer is employed; for ingots of from 10 tons to 12.5 tons, a 15-ton hammer; and for smaller ingots proportionately lighter hammers." As regards simply the ability to forge the inner tube, I think any of the establishments indicated could consequently accomplish it.

Appended and marked C are extracts from the report on metallurgy at the Paris Exhibition of 1878, and from the report on the fabrication of steel cannon at Bochum from the Revue d'Artillerie, February, 1875, which contain some information as to the methods used in France and Germany in the fabrication of frettes. There seems to be nothing in these methods beyond the capacity of our own establishments, and, except in the increased size of the work, they are hardly beyond their experience.

I have also appended, and marked D and E, extracts from your reports on the mechanical properties of Whitworth's fluid compressed steel and Midvale steel, and from my own report on the same properties for the Firth's steel obtained for the guns now in process of construction at this foundry.

I am, captain, very respectfully, your obedient servant,

C. W. WHIPPLE,
Lieutenant of Ordnance.

The above steel, ordered from Midvale Steel Company (price, 12 cents per pound), to be made in accordance with letter of Capt. W. N. Jeffers of May 25th, to the Midvale Steel Works.

Limit of elasticity per square inch	37,000
Tensile strength	80,000
Per cent. of elongation under strain	23
Per cent. of reduction of area of section	44

The elongation of steel just before the failing point is reached not to be less than 23 per cent.

Specimens to be tested at the Washington navy-yard, and the tests of each forging are to be completed and satisfactory before the next is made.

ORDNANCE OFFICE,
Navy-Yard, Washington, D. C., May 9, 1878.

Abstract of tests of specimens taken from 80-pounder, half tubes, ingots Nos. 5624 and 5633, received from West Point Foundry, May 2, 1878.

	Inches.
Length of L specimen	1.00
Length of T specimen	2.00
Diameter of L and T specimens	0.50

Specimens.	After fracture.		Tensile limit.	Elastic limit.	At failure.	Percentage of elongation.	
	Length.	Diameter.				After fracture.	Specific gravity.
	Inches.	*Inch.*	*Lbs. per sq. in.*	*Lbs. per sq. in.*	*Per inch.*	*Per inch.*	
H L 5624	1.221	0.344	85,891	53,470	16.70	22.10	7.840
H T 5624	2.270	0.445	76,650	45,837	10.45	13.50	7.833
I L 5633	1.389	0.311	75,885	43,290	20.40	38.90	7.840
I T 5633	2.383	0.415	78,686	40,744	15.75	19.15	7.846

BENDING TEST.

Specimens were taken from each half tube and marked respectively 1 and 2; all were transverse in direction, the half tubes not being long enough to make a longitudinal bar.

Specimen 5624, No. 1, was placed 2 inches in a vise and struck seventy-five times with a hammer weighing 2 pounds, bending to 90″. It was afterwards struck four light blows with a 10-pound hammer, and broke at an angle of 120″.

Specimen 5624, No. 2, broke at the 37th blow with the 2-pound hammer, having bent 90″.

Specimen 5633, No. 1, broke at the 42d blow, same hammer, bending 90″.

Specimen 5633, No. 2, broke at the 31st blow, with force applied, bending 70″.

Specimen 5624, No. 1, was exposed to a cherry red heat, and found to have tempered to a degree slightly inferior to cast-steel tools.

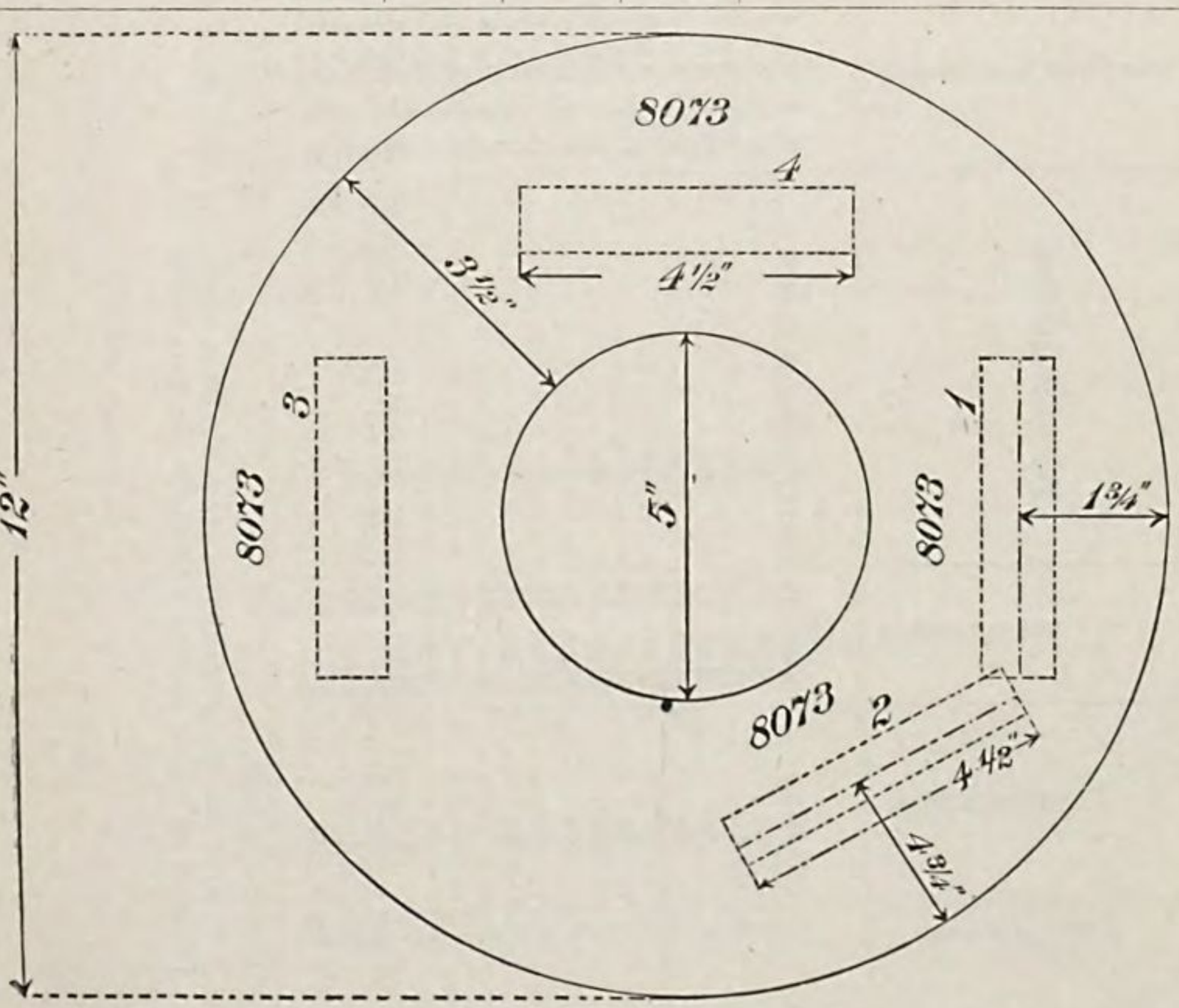
Respectfully submitted.

J. R. SELFRIDGE,
Lieutenant, U. S. Navy.

Lieut. Com. A. S. CROWNINSHIELD,
Inspector of Ordnance.

Midvale Steel Works, October 14, 1881.

Test bar O. H. 3397.	Tensile strength, pounds per square inch.	Per cent. of extension after fracture.	Contraction of area after fracture.	Remarks.
E. No. 8073, T. No. 1	57,040	34½	53.76	Slice cut by Paulding & Kemble from breech end of gun-tube for Haskell's gun, all transverse bars.
E. No. 8073, T. No. 2	60,081	29	53.57	
E. No. 8073, T. No. 3	57,040	32	50.16	
E. No. 8073, T. No. 4	57,040	25	49.02	



B.—*Mechanical tests of six Naylor & Co. steel ingots, hammered at Washington navy-yard.*

Number of ingot.	Where made.	Date of tests.	For what intended.	Location of specimen.	Dimensions of specimen before tests.	Tensile strength, pounds per square inch.	Elastic limit, pounds per square inch.	Elongation.		Specific gravity.	Location of bending specimen.	Number of degrees through which it bent.	Number of blows struck.	Weight of hammer.	Condition after bending.
								At failure.	After fracture.						
		1880.			*Inches.*			*Per ct.*	*Per ct.*					*Lbs.*	
3	Norway	Mar. 10	Sixty-pounder B. L. R.....	B. T. No. 1 ..	2 × .500	67,584	25,974	16.75	23.00	7.824	B. T. No. 1 .	90	12	2	Broken.
3	....do	Mar. 10	.....do	B. T. No. 2 ..	2 × .500	61,505	25,974	8.15	10.20	7.838		149½	5	10	
3	....do	Mar. 10	.....do	B. T. No. 3 ..	2 × .499	65,501	26,076	20.00	22.70	7.822					
4	....do	Mar. 18	.....do	B. T. No. 1 ..	2 × .499	63,452	27,874	23.40	30.35	7.853	B. T. No. 1 .	90	15	2	Broken.
4	....do	Mar. 18	.....do	B. T. No. 2 ..	2 × .500	66,744	25,974	13.95	15.10	7.846		137½	7	10	
4	.. do	Mar. 19	.....do	B. T. No. 3 ..	2 × .500	64,528	27,757	19.35	27.40	7.862					
5	....do	Mar. 20	.....do	B. T. No. 1 ..	2 × .499	59,055	21,730	10.65	11.50	7.850	B. T. No. 1 .	90	10	2	Broken.
5	....do	Mar. 20	.....do	B. T. No. 2 ..	2 × .500	61,014	22,409	15.75	16.50	7.852		145	5	10	
5	....do	Mar. 22	.....do	B. T. No. 3 ..	2 × .499	61,407	24,031	10.20	13.05	7.855					
6	....do	Mar. 24	.....do	B. T. No. 1 ..	2 × .500	66,209	25,974	8.50	9.25	7.854					
6	....do	Mar. 24	.....do	B. T. No. 2 ..	2 × .500	67,737	28,011	12.25	14.45	7.825	B. T. No. 1 .	70	10	2	Broken.
6	....do	Mar. 24	.....do	B. T. No. 3 ..	2 × .500	67,992	26,993	13.25	19.20	7.861					
7	....do	Mar. 24	.....do	B. T. No. 1 ..	2 × .500	67,584	26,993	11.50	11 95	7.820	B. T. No. 1 .	90	11	2	Broken.
7	....do	Mar. 25	.....do	B. T. No. 2 ..	2 × .4995	63,739	24,956	13.55	18.80	7.828		154	7	10	
7	....do	Mar. 25	.....do	B. T. No. 3 ..	2 × .500	61,727	22,918	15.90	19.35	7.840					
8	....do	Mar. 25	.....do	B. T. No. 1 ..	2 × .500	65,038	23,937	12.85	18.90	7.846	B. T. No. 1 .	90	11	2	Broken.
8	....do	Mar. 25	.....do	B. T. No. 2 ..	2 × .500	68,144	26,738	(*)	11.95	7.832		139	7	10	
8	....do	Mar. 25	.....do	B. T. No. 3 ..	2 × .500	62,644	23,683	21.75	29.00	7.830					

*No failure.

The results, as given above, are made from specimens taken from forgings as they come from the hammer. They are now to be roughly turned and bored, then to be tempered in oil before finishing them for the gun tubes.

B.—*Mechanical tests, after tempering in oil, of six Naylor & Co. steel ingots, hammered at Washington navy-yard.*

Number of ingot.	Where made.	Date of tests.	For what intended.	Location of specimen.	Dimensions of specimen before tests.	Tensile strength, pounds per square inch.	Elastic limit, pounds per square inch.	Elongation.		Specific gravity.	Location of bending specimen.	Number of degrees through which it bent.	Number of blows struck.	Weight of hammer.	Condition after bending.
								At failure.	After fracture.						
		1880.			*Inches.*			*Per ct.*	*Per ct.*					*Lbs.*	
3	Norway	.....	Sixty-pounder B. L. R	.....	2 × .500	84, 722	41, 253	.....	2. 50	7. 613	.....	421	13	2	Fractured.
3	....do	May 20	.....do	B. T. No. 1	2 × .500	56, 532	35, 804	3. 90	4. 60	7. 850	B. T. No. 1	90	10	2	No Fracture.
3	....do	May 20	.....do	B. T. No. 2	2 × .500	68, 042	30, 914	14. 80	22. 10	7. 847		180	9	10	
4	....do	.....	.....do	.....	2 × .500	77, 083	39, 126	18. 00	19. 00	7. 826	.....	333	8	2	Fractured.
4	....do	June 11	.....do	B. T. No. 1	2 × .500	73, 951	40, 107	16. 65	24. 25	7. 874	B. T. No. 1	90	14	2	Broken.
4	....do	June 10	.....do	B. T. No. 2	2 × .500	81, 641	35, 592	.....	9. 45	7. 850		112	4	10	
5	....do	June 2	.....do	B. T. No. 1	2 × .500	76, 395	38, 197	6. 40	7. 00	7. 857	B. T. No. 1	90	12	2	No fracture.
5	....do	June 2	.....do	B. T. No. 2	2 × .500	71, 200	40, 744	7. 95	11. 15	7. 865		180	9	10	
6	....do	May 8	.....do	B. T. No. 1	2 × .500	77, 668	39, 853	9. 75	11. 75	7. 846	B. T. No. 1	90	11	2	No fracture.
												180	9	10	
7	....do	June 11	.....do	B. T. No. 1	2 × .500	76, 344	37, 051	9. 15	11. 00	7. 846	B. T. No. 1	90	10	2	Broken.
7	....do	June 11	.....do	B. T. No. 2	2 × .500	81, 284	43, 163	9. 80	12. 65	7. 840		180	9	10	
8	....do	June 9	.....do	B. T. No. 1	2 × .500	80, 036	39, 725	12. 10	11. 00	7. 851	B. T. No. 1	90	12	2	Broken.
8	....do	June 9	.....do	B. T. No. 2	2 × .500	78, 508	37, 994	.....	7. 65	7. 848		180	11	10	

C.—*Extracts from the report on metallurgy at the Paris Exhibition of 1878* (*page* 324).

* * * * * *

Ingots for tires are often cast in an octagonal shape as if for rails; in other shops, in order to avoid the seams, they are cast in molds which give them a round flat shape. (See Figs. 1 and 2.)

In every case, when the ingot has reached a suitable temperature, it is flattened under about a 15-ton hammer, and it is then rounded, if possible, so that after the first heat it may be in the shape of a circular disk, of a thickness varying with the height of the original ingot, and the work to which the steel may be subjected in a single heat. This disk is carried to the reheating furnace, and when it has acquired a suitable heat, it is flattened under the steam hammer to the required thickness, and prepared for the operation of punching the hole.

This operation is performed in two ways. In some shops the hole is pierced in the disks by means of a conical punch attached to the face of the steam hammer, shown in figure 3, the disks being turned three or four times, an operation to be carefully performed, in order to assure the centering of the hole, and to avoid the formation of cracks.

In other works the hole is made with steel punches from 5.90 to 7.87 inches diameter, forced in under the hammer. The metal is upset by the operation, and a hole is obtained from four-tenths to eight-tenths inch greater in diameter than that of the punch.

This method causes a loss of material, but has the advantage over the others of straining the metal less, and permits a nearer approximation to the required weight of the ring. As a fact, ingots cannot be cast with great exactness, and there are always slight differences; but by weighing the ingot before the hole is made, the weight of the piece to be punched out (and consequently the diameter of the punch itself) can be determined, which will bring the ring to the required weight.

The ring so obtained is at once placed upon the beak of an anvil, under a steam hammer, so inclined that not alone will the ring be enlarged, but will be given on one side a conical form, approaching that it will ultimately receive.

The ring is thus drawn out up to half of the finished diameter, being turned on the anvil by means of a lever, and then removed to another hammer to be flattened exactly to the required thickness. The ring is then allowed to cool, and little irregularities corrected with the hammer and chisel. The ring is then rough finished in two heats.

Rolling.—The rings are then placed in the reheating furnace, and when they have acquired a suitable temperature, transferred to the rolling machine. Two classes of these machines are in use—those with horizontal and those with vertical cylinders. The former are the more simple in construction, but they do not make the tires sufficiently symmetrical, and it is afterward necessary to mandrel, an operation which is apt to affect injuriously the quality of the steel. With certain of the machines with vertical cylinders, it is possible to produce tires which are absolutely round.

* * * * * *

Exracts from the report on the fabrication of steel cannon at Bochum, Revue d'Artillerie, February, 1875.

* * * * * *

The greater the diameter of the piece to be forged the greater should be the weight of the hammer in order that the blocks should be thoroughly forged to the center.

The head of the largest steam hammer at Krupp's Works weighs 110,000 pounds; it is of double action, and has a drop of about ten feet. Its power is sufficient to work conveniently the heaviest guns now manufactured.

At Bochum, the heaviest hammer weighs only 33,000 pounds, but, as it is of double action, it is really equivalent to a 66,000 pounds single-action hammer.

* * * * * * *

Fabrication of the frettes.—Frettes are made in the following manner: By casting the steel in molds of suitable dimensions solid cylinders are obtained, which are flattened into disks under a hammer. While still warm they are placed under a second hammer whose face is terminated by a mandrel, so placed as to punch in the center a cylindrical hole.

In this state the frettes are successively submitted to various rollings (in machines such as are used for rolling steel tires), so as to gradually enlarge the interior diameter and diminish their thickness. Ordinarily the frettes are rough drawn and finished in the rolling machine; but sometimes only the roughing is done in the machine, and the frettes are subsequently finished under the steam hammer.

During this last operation, which, it may be believed, guarantees great density, and consequently great tenacity, the frettes are mounted upon an iron mandrel attached to the anvil.

Frettes so constructed have no welds, and consequently no weak points along their contours, which cannot be said of frettes which are made of bars of steel bent into circles.

* * * * * * *

In all cases the extreme limits of shrinkage are determined by the following conditions:

1st. It should never be so great that after the frettes are in place, the tension developed in them or the compression in the inner tube should exceed the elastic limit of the metal; much less its actual strength. Otherwise the pieces, weakened instead of strengthened, would not even have the strength of a gun of the same dimensions constructed of a single piece. Within the first few shots a rupture would occur, either of the frettes, already immoderately distended, or of the inner tube, excessively compressed. On the other hand, it must not be forgotten that steel cannot be heated beyond a certain temperature which is indeed not very high—without the risk of losing, by the slow cooling, of certain of the very qualities which make it valuable as a gun metal. In general terms, the shrinkage should be such that the frettes when heated to a dull cherry red can be easily fitted into place.

2d. The shrinkage ought to be sufficient, so that the frettes may not be released by the violent reactions produced in firing.

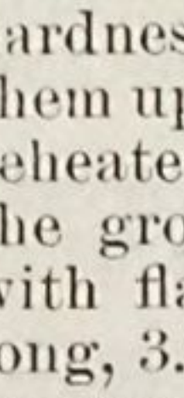
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NOTE C.—*Upon the fabrication of the frettes.*

At Essen the details incident to the fabrication of frettes are not exactly the same as at Bochum.

The cylindrical cast-steel blocks are forged carefully under a 20-ton hammer, and then cut into a certain number of disks, varying generally from 6 to 10. Each of these disks is reheated and then shaped under the hammer to the form shown in figure 6. Two holes about 2 inches in diameter are then made in them, while cold, at each end, and connected by a longitudinal slit in which are driven wedges of gradually increasing thickness, so as to gradually extend the disk into the shape of an

elongated lozenge. The disk is then placed vertically under the hammer and flattened until the lozenge shape has been changed into a square.



It is then hammered to a circular form upon an anvil in which there is a well to contain the rough frette, which is supported upon a cylindrical mandrel attached at each end to the projecting sides of the anvil. By turning the frette so as to successively expose the different parts to the hammer a ring is obtained which is afterward finished to the proper dimensions in the rolling machine and lathe.

In France frettes are made of a puddled steel, made by refining in a reverberatory furnace charcoal pig of good quality.

The balls, being taken from the furnace, are shingled under the hammer and formed into blooms from 15.7 to 23.6 inches long and 3.9 to 4.7 inches square, which are in turn drawn out into bars 10 to 13 feet long, 3.9 to 4.7 inches wide, and eight tenths of an inch thick. These bars are then broken in two, carefully tested, and classed according to their texture, those only being fit for frettes which have a sufficiently great hardness. They cut these in pieces about 39 inches long, and make them up into piles weighing about 176 pounds. These piles, after being reheated to a white heat, are passed first through the roughing rolls, the grooves of which are triangular, then through the finishing rolls with flat grooves, by which they are changed into bars 20 to 23 feet long, 3.9 inches wide, and eight-tenths of an inch thick. In order to increase the density and make the grain more homogeneous the bars are then subjected to a second working, in all respects like the preceding. They are then, upon leaving the last rolls, wrapped at once into a helix about a mandrel, which forms the free end of the lower cylinder of the rolls. The cylindrical rings thus obtained (Fig. 7) are reheated to a white heat and subjected to the action of a hammer. Ten blows suffice to weld all the spirals, care being taken to turn the rings every other blow.

The anvil contains a cylindrical well, which holds the frette while the face of the hammer carries a mandrel, shaped like the frustum of a cone, which fits the interior space.

For frettes of large size they weld together two such rings; they are careful to interpose between them a very thin iron plate, designed to facilitate the welding and to protect the steel from the action of the fire during the two heats which are necessary in order to obtain a perfect union of the surfaces in contact; after the first of these heats the frettes have a shape indicated in Fig. 8; the outside parts having been more especially hammered. After the second heat, the inside layers having in turn been compressed, they assume a form shown in Fig. 9.

In this state the frettes are submitted in succession to the action of two rolling-machines, which differ from each other only in the diameters of their cylinders. In each of these machines the lower cylinder is fixed, while the upper cylinder, on the contrary, can be moved by working the wheel v (Fig. 10), the rotation of which is transmitted to the miter wheels r-r-r' r which control the screws to which are attached the bearings of this cylinder. This is raised so that the frette can be engaged upon the mandrel on the end of it, and then made to descend little by little until the distance a, b (Fig. 10) to the lower cylinder shall be just equal to the required thickness of the frette. Ordinarily, the action of the wheel is replaced by that of a small steam cylinder, placed between the uprights of the frame, the piston of which is attached by gearing to the upper cylinder of the machine, which can, consequently, be lowered rapidly. As soon as the frette has *set*, the movement of rotation is

slackened by acting upon a reversing rod in order to obtain a firmer gripe. The width of the frette is determined by the space *a*, *d*, left between two discs attached respectively to each of the two cylinders. Two guide rolls, *s s*, supported by shanks which turn about axes *o o*, are held by means of circular racks *i i* and pinions, at the proper distance from the upper cylinder, in order to support the frette on the outside.

The frettes, roughened out in the first machine, are finished in the second, then heated to a red heat and tempered in water; when they are completely cold they are transferred to a lathe to be finished to their exact dimensions.

The trunnion-rings are made by means of two cylindrical half frettes, on which, after they have been suitably heated, are formed by a hammer and die, two recesses (Fig. 11), designed to receive the half trunnions (Fig. 12). The half frettes, with their trunnions, are then put together (Fig. 13), properly heated, and welded in four heats.

During the hammering they are held in their respective positions by means of a stamp and die.

After having been tempered, the trunnion-rings are finished in the lathe and planing-machine.

Sometimes the trunnions, instead of being so made, are formed from the metal of the frette itself.

In this case a different process from that described is pursued in the preparation of the ring.

Between two plates encircled with steel bars they place side by side a series of bars of trapezoidal cross-section arranged like the voussoirs of an arch; the annular bundle, so obtained, is brought to a white heat and welded all over under a hammer, in the anvil of which is a groove for its reception.

The frette is then reheated, mounted upon a cast-iron mandrel of large dimensions and transferred to the steam hammer. The ends of the mandrel are supported on the projecting sides of the anvil, while by means of stamps suitably arranged the metal is drawn out little by little to the ends of the same diameter (Fig. 14), so as to rough out the trunnions. At the same time the frette itself is drawn out on the mandrel which supports it until the required dimensions are approximately reached, when it is finished in the lathe and planing-machine.

D.—*Extract from table showing mean mechanical properties of Whitworth's fluid compressed steel employed in the construction of 8-inch breech-loading rifle No.* 1.

Original dimensions of specimen.	Nature of property.	
Area, 0.333 square inch	Density	7.8543
	Hardness	16.24
	Hardness of copper	3.33
	Pulling stress per square inch:	
Length 10 inches; diameter, .6515 inches: area, 0.333 inch.	Elastic limit.....pounds.	34.333
	Ultimate resistance.....pounds	84.333
	Ratio of elastic ultimate resistance.....per cent.	40.72
	Extension per inch at elastic limit.....inch.	0.00157
	Ultimate extension per inch.....inch.	0.21717
	Ultimate restoration per inch.....inch.	0.01833
	Ultimate set per inch.....inch.	0.19884
	Reduction in area at point of fracture.....per cent.	43.23
	Ultimate resistance per square inch of fractured area..pounds.	148,559
	Appearance of fracture	Crystalline and fibrous.

D.—*Extract from summary of mechanical properties of Midvale steel.*

Nature of property.	Specimen.		Hammered.		
	Length.	Diameter.	Maximum.	Minimum.	Mean.
	Inches.	*Inches.*			
Density			7.8483	7.8446	7.8464
Hardness					18.00
Hardness of copper, 3.33					
Pulling stress:					
Elastic limit	10	0.65	50,000	48,000	49,000
Extension per inch at elastic limit			0.0023	0.00188	0.00169
Ultimate resistance			90,000	89,000	89,500
Ultimate extension per inch			0.1898	0.1684	0.1791
Ultimate restoration per inch			0.0052	0.0050	0.0051
Ultimate permanent set per inch			0.1358	0.1091	0.1224

E.—Mechanical properties of Firth's steel received at the West Point Foundry for use in gun constructions.

Specimen.	Number of breech receiver.	Rifle.	Tenacity.	Elastic limit.	Extension per inch.	Specific gravity.	Hardness.
			Pounds.	*Pounds.*	*Inch.*		
1	1	8-inch	84,000	22,000	0.240	7.9184	17.999
2	1	do	84,000	49,000	0.207		
1	2	do	82,000	34,000	0.245		
2	2	do	83,000	43,000	0.217	7.8326	18.287
1	3	do	85,000	48,000	0.233		
2	3	do	86,000	47,000	0.254		
1	4	do	85,000	45,000	0.249	7.8818	17.999
2	4	do	80,000	43,000	0.216	7.8233	17.535
1	5	do	74,000	40,000	0.254	7.9002	14.73
2	5	do	74,000	40,000	0.261	7.9002	14.73
3	5	do	82,000	45,000	0.171	7.8979	18.981
4	5	do	78,000	47,000	0.098	7.8586	21.169
5	5	do	75,000	35,000	0.270	7.9002	14.73
1	1	11-inch	61,000	22,000	0.224	7.8775	9.313
2	1	do	51,000	22,000	0.052	7.8816	9.718
3	1	do	60,000	19,000	0.290	7.8746	9.929
4	1	do	60,000	19,000	0.309	7.9215	9.313
5	1	do	59,000	17,000	0.284	7.8889	9.138
1	2	do	62,000	19,000	0.268	7.9088	11.594
2	2	do	62,000	22,000	0.289	7.9672	10.601
3	2	do	62,000	19,000	0.304	7.9063	9.718
1	1	12-inch	61,000	20,000	0.291	7.8279	13.986
2	1	do	62,000	17,000	0.227	7.9422	12.716
3	1	Howitzer	60,000	17,000	0.292	7.9231	15.432

L. R., No. 248.] ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, February 21, 1882.

To the CHIEF OF ORDNANCE,
U. S. Army:

SIR: Referring to my letter of December 30, 1881, I have the honor to transmit herewith, as supplementary thereto, certain information respecting the mode of inserting the lining tubes and of shrinking on the frettes in the fabrication of French guns.

Respectfully, your obedient servant,

CHAS. S. SMITH,
Captain of Ordnance.

[First indorsement.]

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, February 21, 1882.

Respectfully referred to the Board on Heavy Ordnance and Projectiles, in connection with my letter of January 17, 1882.

In continuation of the subject of the Italian 100-ton gun, an extract from the Revue d'Artillerie for January, 1882, is inclosed, showing the present status.

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

[Extract No. 1.]

The French and Swedish guns of large caliber are provided with one or two rows of frettes of puddled steel (to increase the power of resistance). The frettes are constructed at the factory of Petin, Gaudet & Co., at Rives de Gier, by coiling steel rails about a mandrel into a ring, which latter is finished by the round-cylinder process. It is a general rule to make the fretted part of the cast-iron body about 1 caliber thick, and the frettes 0.5 or 0.25 of a caliber, according to the number of rows used. Since the inner diameter of the frettes is smaller than the exterior diameter of the cast-iron body to be encircled,* it is necessary to heat the frettes before shrinking thereon, in order to expand them.

When the steel frette has attained the necessary temperature, which is easily ascertained by sprinkling sawdust on it (the sawdust takes fire immediately, if the proper degree of heat is reached), the frette is shrunk upon the barrel from the rear and cooled naturally for about ten minutes, and afterwards by means of a watering-pot with a finely perforated nozzle. Each succeeding frette is then pushed to the one preceding and pressed to it by a simple screw apparatus.

After the first row of frettes is put on and turned as cylindrically as possible on the lathe, the second is adjusted in the manner above described. The pressure produced by the frettes causes a measurable decrease in the diameter of the bore, which is, according to the tension of the coils, from 0.003 to 0.007 inch (0.1 to 0.2 millim.).—(Modern Artillery, J. R. Von Eschenbacher, Lieut. of Artillery, 1872.)

[Extract No. 2.]

The hoops are heated singly in a furnace of peculiar construction, which is shown in Fig. 62. A represents the fire-box of the furnace; *c*

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* In the trials made in France to determine the limit of tension to be allowed the frettes, it was demonstrated that a diminution of their diameter of 0.058 inch on the frettes tested (1.5^{mm}) was to be considered the maximum, if the limit of elasticity of the puddled steel is not to be exceeded, that is, a permanent expansion of the coil is to be avoided. Lieutenant Gadaud, of the navy, gives, in his work, "L'Artillerie de la Marine française," the following data in regard to the difference of diameter in barrels and frettes:

Caliber.	Inches, 6.48.	Millim. 164.7.	Inches, 7.64.	Millim. 194.0.	Inches, 9.45.	Millim. 240.0.	Remarks.
	With one frette.		With two frettes.		With two frettes.		
Difference between inner and outer diameter.	0. 035	0. 9	0. 027 0. 035	0. 7 0. 9	0. 043 0. 046	1. 1 1. 2	Of the first row. Of the second row.

a platform of iron, which can be turned around, by means of the crank and beveled wheel (*d*), so that the hoop (*b*) which rests on it can be brought in contact with the flame uniformly in all its parts. When the hoop has received "a blue heat" it is taken away and slipped onto the gun, which has been carefully turned to a given dimension to receive it. It is cooled in all its parts by an apparatus resembling a circular watering-pot. (See Fig. 63.) A represents the watering-pot, which is supplied with water through the hose (*b*). The inner surface of the watering-pot is perforated with numerous small holes, through which a spray of water is thrown over the entire surface of the ring *c*, enveloping the body of the gun, which is shown at *d*. To heat the body of the gun for the purpose of inserting the lining tube it is placed in the gun-pit of the foundry, and a brazier of burning coke placed over it. The construction of this brazier is shown in the accompanying sectional Fig. 64. A represents the body of the gun, into which the tube is inserted; *b* the lining of the brazier, which separates the burning coke (*c*) from the gun; *d* a lining made of fire-brick, inclosed in a circular iron frame or cage (*e*). Vertical spaces are left between the fire-brick for the admission of air. The great size of the work and the nice fit of the tube necessitate great care in turning and boring. No trace of the joint between the steel tubes and cast-iron bore of the body could be observed. That the work of the entire gun is made with great care and skill is shown by the weights marked on two 27-centimeter guns, which only varied some 22 pounds in something like the same number of tons. (Col. J. G. Benton, Report to Chief of Ordnance, December 18, 1875.)

L. R., No. 262.] ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, March 30, 1882.

The CHIEF OF ORDNANCE,
U. S. Army:

SIR: Referring to your instructions of December 3, 1881, I have prepared, and herewith respectfully submit, certain plans $\frac{E}{1}$, $\frac{E}{2}$, $\frac{F}{1}$, $\frac{F}{2}$, $\frac{G}{1}$, additional to those forwarded with my letter of December 30, 1881, regarding a modification of the existing plans for the 12-inch B. L. rifles now under contract.

These plans differ mainly from those previously forwarded, by the substitution, in a large measure, of steel wire for steel hoops, which it is believed can be more readily procured in this country than the hoops, and if properly applied will give a stronger gun. The question of the successful application of the wire can only be ascertained by experiment, but such experiment would be productive of very valuable experience. The cast-iron body of the gun has also been reduced somewhat, making a lighter gun. As to the cost, this mode of construction will be as expensive, perhaps, as the hooped gun, at least with the first guns.

The cost of a gun constructed on one of these plans has been estimated as follows:

Cost of material:	Per pound.
Cast-iron body, finished and rifled	$0 12
Steel wire	15
Steel hoops, rough-turned and bored	20
Trunnion hoop, turned and bored	40
Steel tube and B. block, turned and bored	35
Wrought-iron hoops, turned and bored	35

The labor of finishing and assembling has been estimated at 30 per cent. of the cost of the material, and the manufacturer's profits at 33 per cent. of the cost of labor and material. Upon this basis, for the same cost and weight of materials, the final figures would foot up to about the same as under the existing contract.

The cost of the gun computed as above would be as follows:

$\frac{E}{1}$, $32,000; $\frac{F}{1}$, $34,240; $\frac{G}{1}$, $38,165.

The above figures certainly appear fair enough, and probably would not differ much from the actual, were such guns in current fabrication. As the figures stand, they are about double the price paid for hooped cast-iron guns in France and Italy. But inasmuch as a gun made on one of these plans would be to a large extent an experimental fabrication the cost might exceed somewhat the above figures, particularly as to the cost of steel hoops.

I desire here to state, in reference to the estimates appended to my letter of December 20,1881, submitting plans for a 12-inch B. L. rifle on the French and Italian systems of construction, that being based on the 12-inch-rifle contract rates for steel and cast iron, they are erroneous. The recent information received at this office from France on the prices of steel gives the price of tube steel at 37 cents per pound, or about the same as the contract price for the breech receivers for the 12-inch B. L. rifles. The price for hoops is only 19 cents per pound. In the estimates in question the cost of the hoops was estimated at the same rate as the tube, and the total cost was therefore much too great. Making this correction, or estimating on the same basis as for the plans accompanying this letter, the cost of a gun on the plan $\frac{A}{1}$, the heaviest one, would fall to about $41,000. By reducing the dimensions of the tube and cast iron body to those shown on inclosed plan $\frac{G}{1}$, and the thickness of the hoops to 7.25 inches, which it is believed will not materially weaken the gun, the weight of the French gun can be reduced to 56 tons, and the cost, estimated as above, to about $37,500. A plan showing these modifications will be submitted in a few days.

Respectfully, your obedient servant,

CHAS. S. SMITH,
Captain of Ordnance, Principal Assistant.

[First indorsement.]

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, March 31, 1882.

Respectfully referred to the Board on Heavy Ordnance, &c., New York, in connection with my letter of January 17, 1882.

While I approve the substitution of steel wire for hoops, as contemplated on the within plans, I believe that experiments in the use of steel wire, in its application to gun construction, would best be begun on an all-steel gun of small caliber, and it is my purpose to submit to the Board in a few days an 8-inch steel-wire gun, the plans being now under preparation at this office.

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

L. R., No. 267.] ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, April 11, 1882.

The CHIEF OF ORDNANCE, U. S. Army:

SIR: Herewith I have the honor to submit a design for an 8-inch steel-wire B. L. gun, prepared in obedience to your instructions.

In its general features this design is an adaptation of the Armstrong steel-wire system—a method of construction in favor of which it can be said that it has already won a measure of success, viewed from the standpoint of the "production and trial of an actual gun."

The dimensions of this 8-inch gun have been so proportioned that the factors of safety, as regards both lateral and end strength, shall be about the same as in the Armstrong gun. There is no longitudinal application of the wire in this plan; the system depends for end strength wholly upon the tube and its jacket. The wire should be wound on the inner tube, under a constant tension, and either in separate lengths, fastening the ends to the terminal collars, or as one continuous wire, splicing the ends of the wires by brazing, or such other mode as should be found to be most suitable. The hoops would be put on hot, so as to gain the advantage of shrinkage.

The various details of fabrication, as the size, form, and quality of the wire, mode of fastening, winding, degree of tension, &c., are not fully matured as yet, but have been left for future consideration, aided by some experiment. For an 8-inch gun the construction could perhaps have been simplified, but in its present shape the plan would seem to be alike applicable to small and large guns. As to the cost of a first gun, it is not practicable to make anything more than a rough estimate. Assuming that such a gun would in its experimental stage be fabricated at Frankford arsenal, where some experience has already been acquired in winding wire, then it will perhaps be a close enough approximation to assume the cost somewhere between the price paid abroad for an all-steel gun as made at government works, the materials being purchased from the general trade, and as made by private manufacturers, who expect to make a profit.

The price of the French all-steel gun of large caliber is about $764 per ton, that of Krupp's from $940 to $1,100 per ton. So that if we allow $900 to $950 per ton for this 8-inch gun, we cannot go far amiss, but it is exclusive of plant.

The steel for a trial gun, it is believed, would best be imported from abroad, and of all imported steel the preference should be given to Whitworth's fluid pressed steel, which fully equals in the qualities of tenacity and elasticity the best oil-tempered steel, and far exceeds it in the qualities of ductility and homogeneousness. That the steel for an experimental gun should be of the best quality that can be procured, seems to be in the nature of a self-evident proposition, if the object of the trial is to test the general character of the construction. If *that* is proved to be a sound and good one, then the question of employing steel of home production, in a similar construction, would be in order. But if character of construction and quality of material are to enter as unknown quantities at the same time into the problem of the gun's endurance, then, in the event of failure, the effect due to one may be so complicated with that due to the other that it will be impossible to trace up with certainty the true *cause* of failure.

The steel wire could be procured in this country, though some preliminary tests and experiments would perhaps be necessary. It is a matter of fact that there exists a wide difference in the mechanical qualities of annealed and unannealed steel wire, the latter having a

much higher tenacity and elastic limit, and much less ductility than the former. It seems probable that the annealed wire is that used in the Armstrong guns, from the manner in which it admits of being bent and folded at the points of its attachment to the gun body. The *ends* of the wires, as bent, must be annealed. Further information, it is hoped, will be gained on this point, as the Department has taken steps to procure samples for test of the wire used, both in the Armstrong and the Schultz guns.

There are three important features in the Armstrong construction to which attention is invited:

1st. The employment of two comparatively light tubes, instead of a single heavy one, to give the necessary end strength, the tubes being so locked together that the longitudinal strain is thrown upon both of them. Thus tubes of better quality will be made, and, owing to smaller size, their production in this country will be facilitated.

2d. Such an application of the wire, that there is little or no break in the continuity of the wrapping throughout the wired portions. Thus the gun will be made as strong as possible.

3d. Placing the wire as close to the surface of the bore as practicable, which is the position where it can be best utilized. Thus a less quantity of wire will be required and the gun be made as light as possible.

It is of the first importance in assembling, under shrinkage, the solid steel parts in this construction, that perfect contact be secured between locking and abutting shoulders, by means of which the strain thrown upon one part is to be transmitted, in a degree, to other parts and sustained by them. Thus the efficiency of the inner tube and jacket as a compound tube depends mainly upon the fit at the rear shoulder, by which part of the longitudinal strain is thrown upon the jacket, and thence through the medium of the front shoulder to still another point of support in the trunnions. To secure this important end, the jacket having been heated up and placed in position on the tube, the cooling should be made to begin, and proceed most rapidly at the forward end, and recourse be had to some such device as that used in the Armstrong guns, and indicated on the inclosed drawing, of serrating and coppering the surfaces of contact, in order that the jacket may hold fast at that point first, and as the remainder of it cools to pull up against the rear shoulder with some degree of tension. The employment of screwed surfaces also appears objectionable with shrinkage; for a certain "play" must be allowed between the threads to admit of their being united after one tube has been heated up; and afterwards a certain amount of "permanent set" usually remains in the cooled metal that, unless nicely calculated for, prevents more than a partial bearing between the threads. It is on this account that, in the Armstrong guns, after forming a shallow recess between the tubes, and cutting a thread upon the surfaces, phosphor-bronze is poured in to form, on solidifying, an interlocking and true-fitting screw. In the Armstrong 13-inch steel riband gun this method has been employed, apparently to unite the jacket to the inner tube at the base and the trunnion hoop to the jacket. Another method of supporting the tube by the jacket, and causing them to act together as a single tube, is shown on the drawing, and is believed to be the construction employed in the Woolwich wire guns. The breech block is supported by the inner tube in part, and in part by the jacket, by which arrangement the end strain is thrown upon both.

The chamber in this 8-inch gun is proportionately shorter and of greater diameter than in the Armstrong guns. The long and narrow

form of the Armstrong chamber seems to result from the employment of the prismatic powder, which requires that the shape of the cartridge shall be carefully conserved after the charge is placed in the chamber, in order that at the moment of ignition the powder prisms may be retained in their primitive and systematically arranged positions. Prismatic powder therefore may not be heaped up in the chamber, as is done with hexagonal or pebble powder, and the maximum diameter of the cartridge is determined by the size of the mouth of the chamber; while its length will be still further increased by the reduction in and of its cross-section, due to the form of the powder prisms themselves. A shorter and more advantageous form of chamber, it is thought, can be successfully employed with suitable powders, not prismatic, although it is understood that the department is now contemplating some experiments in the manufacture and trial of prismatic powder. A hexagonal powder, manufactured by the Messrs. Du Pont, a sample of which was tested at Sandy Hook last year, will, it is believed, prove to be specially adapted for use with large charges. The powder contains 5 per cent. less saltpeter than the standard service powder, which is replaced by charcoal; and carbonic oxide, rather than carbonic acid gas, results from its combustion. Nearly double the quantity of gas is thus produced as from the ordinary powder, and being accompanied by a much less heat of combustion, there should be a much less pressure before the projectile starts, and much less rapidly decreasing pressure as the projectile moves to the muzzle. That is to say, there is produced a body of gas large in volume, but of a comparatively low tension. Such powder possesses, moreover, a further advantage, in that a much larger proportion of the products of combustion are placed in the form of permanent gases, and thus the erosive effects on the bore of the gun, which are due chiefly to the action of the liquid products, must be in a manner lessened.

With the employment of the large charges contemplated in this gun, the charge should be fired by central ignition and near the forward end of the cartridge by the aid of a tube located within the cartridge, after the English method.

Respectfully, your obedient servant,

CHAS. S. SMITH,
Captain of Ordnance, Principal Assistant.

[First indorsement.]

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, April 12, 1882.

Respectfully referred to the Board on Heavy Ordnance and Projectiles, New York City, for its consideration.

As our method of gun construction is now at a period of transition, and possibly of complete transformation, it would seem wise, in proposing a new system for trial, to select that which gives promise of being the best, within the reach of our productive resources and manufacturing facilities, in the present or the early future state of their development.

Acting under this impression, I have directed the preparation of the within plan of a steel-wire gun, believing that, while open to modification, it represents a mode of construction that, if successfully reduced to practice, offers certain marked advantages in point of *strength* of construction and facility of fabrication over other built-up systems, at the same time that it admits of the use—in steel wire—of a quality of

metal that is not only the best, but can be procured with the least degree of difficulty and uncertainty, and at the lowest cost.

It was decided to adopt a caliber of 8 inches for this gun, because it is believed that in adventuring into new fabrications and trials of experimental heavy guns, the true plan is to begin at the lowest caliber, where the smaller masses involved are more easily procured and wrought, and the loss, should failure occur, is of less moment; and then to work up gradually to the higher calibers, in proportion as our experience becomes larger, our facilities for fabrication increased, and as *success* is obtained with the smaller calibers under actual trial.

A gun possessing the high power, and yet the comparatively light weight, of this proposed 8-inch rifle, will supply a real need of our coast armament, and its use is contemplated and a distinct role assigned to it in the plan of harbor defense, as sketched out by the Board of Engineers for Fortifications.

Again, the size and weight of tube required for guns of this caliber are not so great as to baffle the means and skill now at the command of our steel manufacturers, and their production in quantity would serve as a much-needed stimulus to a still further development of home industries.

But, after all, the chief argument in favor of the fabrication of a gun of small caliber is the argument presented first; it is beginning at the right place to develop and establish a system of gun construction.

It cannot, indeed, be affirmed that the steel-wire system, which is here recommended, has as yet been so far developed and tested as to be pronounced a complete success. That would be going, perhaps, too far. This construction is still in the experimental stage, less or more, and doubtless there is much to be learned and many improvements are yet to be applied before it can be claimed for it that it is altogether the best system of construction. The Engineer of March 10 states that in England experiments with wire guns continue, but that no definite conclusions are arrived at as yet. Nevertheless, this gun is to-day the most advanced form of steel guns, and it is the most promising, despite its very recent appearance at the proof butts, and the rather limited nature, thus far, of its trial.

The whole system of this wire-gun construction is well summed up in the words of Sir William Armstrong: "Of the theoretical advantages of this system there can be no doubt, but that difficulties only begin when we endeavor to put the theory into practice, and no solution of the problem of how to do it can be accepted without the production and trial of an actual gun."

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

L. R., No. 276] ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, April 28, 1882.

The CHIEF OF ORDNANCE,
U. S. Army:

SIR: Herewith I have the honor to submit three plans, designs for heavy ordnance, as follows:

Plan H, a 12-inch B. L. rifle on the French system of construction, revised as contemplated in my letter of March 30;

Plan K, a tracing of plan $\frac{G}{1}$, with slight alterations in the dimensions

of the internal tube, to be substituted for the "sun print" forwarded with my letter of the above date; and

Plan L, a 12-inch M. L. rifled mortar.

The weight of the 12-inch French gun in plan H has been reduced to 56 tons, and the cost, on the same basis of estimate and subject to the same qualifications as stated in my previous letter, should not exceed $38,000.

In this revised plan, the area of the cast-iron body in a cross-section over the chamber is 6.1 times that of a similar section through the chamber, which, when added to the area of cross-section of the tube, gives an aggregate area of about seven times that of the cross-section of the chamber. The area of cross-section in the cast iron over the base of the tube increased by that of a cross-section of the tube over the chamber is 6.3 times the area of cross-section of the chamber, and when the resistance due to friction between the tube and its casing is taken into account, by which the longitudinal strain is in a considerable measure supported by the thicker portion of the tube, the strength at that point may be safely assumed to be equal to that over the chamber.

It is desirable, of course, to mass the weight of the piece in the breech portion, so far as that can be done consistently with the general strength of the structure, and to leave the chase as light as possible; and this principle has not been lost sight of in the preparation of the plans heretofore submitted, but it is applied to a still greater extent in the present plan.

Even now the gun has thicker walls over the chase, relatively to the cross-section of the bore, than the Italian 100-ton gun, cast-iron hooped.

I have calculated the factors of safety, as against tangential rupture, in the same manner as for the other plans, using the same tenacities and pressures, and the only material effect of the reduction in the dimensions has been to render those factors more nearly equal throughout the length of the bore. The factor of safety is 3.38 over the chamber; at the muzzle it is 3.43; the elastic resistance is 24.3 tons per square inch of bore over the chamber; at the muzzle it is 3.37 tons. I have also calculated the factors of safety by means of Captain Clavarino's formula; but I am not altogether satisfied with the results obtained by the use of either his formula or that of General Virgile.

In verifying the factors of safety calculated for the Italian 100-ton gun, I find that those obtained by General Virgile and Captain Calvarino (see Ordnance Note, 174, p. 5) are only to be arrived at by introducing in the general formula for the resistance of a composite tube the condition that, for the cast-iron body, the metal works equally throughout its thickness in supporting internal strains—a condition which only obtains when interior cooling has been perfectly applied, and which, it is generally admitted, is never the case in practice.

The tube in this plan has been extended forward as far as the commencement of the conical part of the chase, as it was thought that, on account of vibrations, the shoulder angle in the cast iron at the end of the tube might prove a source of weakness, and the further forward from the termination of the hooping it is located the better; or else it should lie wholly within the hooped portion. A change has also been introduced in the seat for gas check, as it is proposed to use the English cup obturator instead of the Broadwell ring.

Plan K represents a 12-inch gun on the French system, except that the steel hoops are replaced to a great extent by steel wire. This plan has already been described in my letter of March 30; the weights, estimated cost, &c., are substantially the same as for plan $\frac{G}{1}$.

Plan L represents a 12-inch M. L. rifled mortar, prepared in pursuance of your instructions. The weight of the piece—12½ tons—is only 6,000 pounds greater than that of the Krupp or the Prussian 11-inch steel mortar; but it is about 4,000 pounds heavier than the French 11.8-inch cast-iron hooped mortar. The latter, however, employs a charge of only 40 pounds and a shell of 484 pounds, while with this 12-inch mortar it is proposed to use a charge of from 50 to 55 pounds and a shell of from 500 to 550 pounds. The area of the cast-iron body in a cross-section over the bore is more than five and a half times that of the cross-section of the bore, which is deemed to be ample for longitudinal strength, as it is probable that the pressure to which the piece will be subjected will fall below 30,000 pounds per square inch of bore. The cost of this mortar is estimated at $6,342, when in current fabrication; the cost of a first piece at $7,148.

In working up this plan it was thought that the old method of loading from the muzzle was, on the whole, the best adapted to the purposes of a mortar.

As a muzzle-loader, the piece would be somewhat lighter and considerably cheaper, and could be manufactured in much less time; and, on the other hand, no objection exists to muzzle-loading with a piece so short as a mortar, and which, at the same time, when in service is so well protected from direct fire as to afford great freedom of movement to the cannoneers in the service of the piece.

In the English service the rifled mortars are muzzle-loaders, and so, also, are the recently introduced 9.5-inch and 11.8 inch mortars in the French service. In 1874 it was, indeed, claimed in France (see Ordnance Note 68, p. 547) that it was essential that a rifled mortar

Should be loaded from the breech, in order to give the shell sufficient stability in flight, which can only be obtained in a short piece by an exact centering of the projectile—an end much less difficult of attainment with a breech-loader than with a muzzle-loader.

But later, it is stated by Captain Gadaud, of the French navy (Carnet des Notes et Renseignement, 1881, p. 62), that

In consequence of experiments made in 1878 with an 8.66-inch (22 centimeters) howitzer, there were adopted two mortars, of cast-iron hooped and loading at the muzzle, of 9.45 inch (24 centimeters) and 11.8 inch (30 centimeters) caliber respectively; the object had in view being the prompt procurement, and at little expense, of a great number of mortars easy to serve and not requiring the care or need of repairs that breech-loaders do.

So it would appear that with the French navy, at least, it was thought that the gain in accuracy of fire in the breech-loader would be more than compensated for, with muzzle-loaders, by the gain in the *number* of pieces.

The relative merits of the two systems of breech-loading and muzzle-loading are clearly and forcibly stated by Sir William Armstrong, in his address before the Institution of Civil Engineers in January, 1882, as follows:

The question whether breech-loading or muzzle-loading guns are most advantageous is one which had been discussed in a very uncompromising spirit, as if one or other of the two systems ought to be universally adopted, to the entire exclusion of the other. Impartial consideration, however, will show that there is room for both systems, and that each is best in its proper place. It has been distinctly proved that, so far as accuracy and velocity are concerned, there is nothing to choose between them. Neither is there any material difference in regard to rapidity of fire; nor would a superiority in this respect on either side be of much value, seeing that it is of far more importance to cultivate careful and deliberate fire than to facilitate a lavish expenditure of the very limited supply of costly ammunition that can be assigned to each gun in active service. With regard to convenience of loading and security of the gunners, the ad-

vantage is in most cases, though not in all, on the side of the breech-loader. Guns mounted on the broadsides of ships or in casemated batteries cannot be loaded at the muzzle by any known method without very seriously exposing the men to the fire of machine-guns and small-arms. In fact, the great length of modern guns renders it impossible to get access to the muzzle for the purpose of loading without allowing more space for recoil than is practicable in a ship, or in the usually confined space of a casemate; so that in these cases breech-loading must be regarded as a necessity. But in earth-work batteries a muzzle-loading gun can, by proper arrangement, be loaded under the shelter of the parapet more securely and quite as conveniently as a breech-loader. In revolving turrets, also, a gun may be loaded at the muzzle by external means, involving no exposure of the men, and in gunboats carrying a heavy gun on the line of the keel, loading at the muzzle is also easily effected.

The superior simplicity of a muzzle-loading gun entitles it to a preference wherever it can be used with equal advantage. All breech-loading mechanism is of a nature to require very accurate fittings, such as require care both in use and for preservation. Breech-loaders, therefore, are very unfit weapons for imperfectly instructed gunners, and they are quite out of place in open batteries where they would be exposed to the injurious influences of the weather and of drifting sand. It would be folly, therefore, in such cases to use them in preference to muzzle-loaders, which require little care for their preservation and take no harm from exposure.

It is not thought that the service of the piece would be at all retarded by the substitution of muzzle-loading for breech-loading. If the piece is to be loaded when out of battery, the top carriage, recoiling first on sliding and then on rolling friction, would be caught and held back in recoil by an automatic clutch, which, after the piece had been loaded, could be disengaged by pressing on a lever so as to allow the piece to run into battery. A device of this kind has been tried at Sandy Hook and has worked very satisfactorily with carriages constructed as above described.

In the fabrication of any one of the proposed guns on the plans I have submitted, all of them being with us experimental guns, it is thought that the steel hoops and tube should be procured from abroad in order to save time in the fabrication, and to subject only the construction itself to trial at first. The best tube could probably be obtained from Sir Joseph Whitworth & Co., Manchester, England; while the hoops of rolled cast steel would be best procured perhaps from the Creusot Works of Schneider & Co., in France.

Appended hereto is an extract from the "Carnet des Notes et Renseignements," of Captain Gadaud, French navy, relative to the plating of decks, &c., and to the penetration of the French 9.5-inch and 11.8-inch M. L. rifled mortars.

Very respectfully, your obedient servant,

CHARLES S. SMITH,
Captain of Ordnance, Principal Assistant.

P. S.—I should state that the above estimates of cost for a 12-inch mortar were furnished me by Lieut. C. W. Whipple, Ordnance Department, inspector at the West Point foundry, but they agree very closely with my own. The cost of a first piece is inclusive of the cost of "preparations." Lieutenant Whipple's estimate on the 12-inch B. L. rifle (Plan H) is $35,170, using the same rates for material that I did, except for cast iron, which he reduced to $9\frac{3}{4}$ cents per pound; but he increased the manufacturer's profits to 35 cents per pound. His estimate on the cost of preparations is $6,000, which must, of course, be added to the above for the cost of a first gun, making a total of $41,170.

C. S. S.

APPENDIX.

[Extracts from the "Carnet des Notes et Renseignements" of Captain Gadaud, 1881.]

EFFECT OF FIRE AGAINST DECKS.

It has been the practice now for some years to protect the decks of war vessels by plates 1.97 inches, 2.36 inches, and 3.15 inches thick. Projectiles striking on such decks, under angles less than 5°, glance off; but beyond that limit cored shot begin to make an opening when the thickness of the plating is not equal to at least one-fourth of that required in plates to resist a direct fire from the same projectiles. The opening is always greater in the deck-flooring, or skin that supports the plates, than in the plates themselves; a filling, or cushion of wood, is interposed between the plating and the skin.

Following are some dimensions of the heaviest plated decks relative to ships now actually afloat, viz: Thickness of plating, 3.54 inches; thickness of wood filling, 4.83 inches; thickness of skin-plate, 0.43 inch. The plates are ordinarily 78.74 inches long, by from 47.24 inches to 59.05 inches wide, and are fastened to the skin by bolts passing through the wood filling. Steel shells striking on unplated decks under an angle of 5° burst from the shock and produce very large openings.

It has appeared necessary to direct attention here to the utility of curved fire; mortars constitute in fact a formidable mode of attack against the decks of vessels. Every power has adopted them for coast defense, notwithstanding the uncertainty incident to that kind of fire (page 79).

9.45-INCH AND 11.8-INCH MORTARS.

The 11.8-inch mortar has been so designed as that it shall pierce at extreme range decks covered with 3.54-inch plating; up to the present time a thickness of plating of 3.15 inches has hardly been exceeded either in France or abroad. The 9.45-inch mortar will also pierce 3.54-inch plating at short range; but at extreme range it will only pierce plates of from 2.36 inch to 2.76 inch in thickness (page 62).

The weights of the above pieces are 13,000 and 23,680 pounds; charge, 22 and 40 pounds; shell, 264 and 484 pounds, respectively.

The service of the piece requires four men and one chief of piece each.

[First indorsement.]

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, April 29, 1882.

Respectfully referred to the Board on Heavy Ordnance and Projectiles for its consideration, and inviting its attention in connection therewith to my letter of January 17, 1882.

While I am of the opinion that the fabrication of all steel guns, such as recommended in my indorsement of 12th instant, should now be undertaken by us, I think that while awaiting the further developments of our steel industries to admit of the production of steel guns of larger caliber than 8 inches and in such quantities as may be required, a good gun of moderate power can be made on the within plans.

In our coast armament a heavy rifled mortar has long been felt as a

necessity, and the plan herewith inclosed has been prepared with a view to supplying that want.

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

L. R., No 290.] ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, May 15, 1882.

Lieut. F. E. HOBBS,
Recorder Board on Heavy Ordnance, &c., New York:

SIR: I have the honor to submit herewith, with the consent of the Chief of Ordnance, a tracing (M.) of a 12-inch rifle, cast iron hooped with steel, to be substituted for the "blue prints" $\frac{D}{1}$ and $\frac{D}{2}$ originally submitted by me. The plans are substantially the same, except that the weight has been reduced two tons in this last one. Will you please communicate the contents of this letter to the Board, and, with its permission, include the within tracing in its report?

Respectfully, your obedient servant,

CHARLES S. SMITH,
Captain of Ordnance, Principal Assistant.

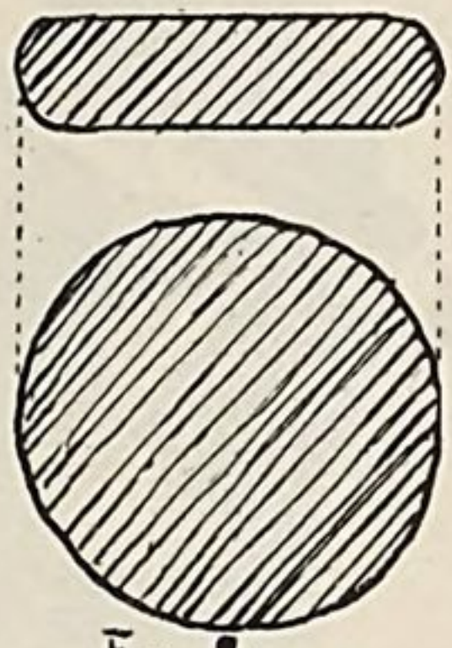


Fig 2

Round, flat, Ingot

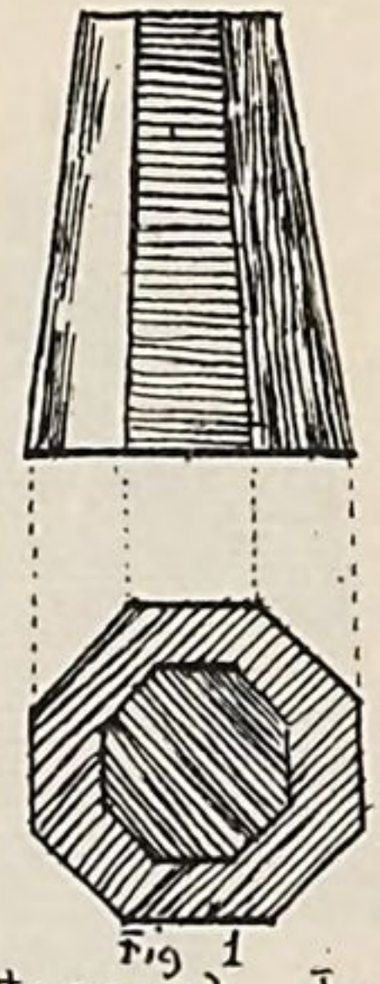


Fig 1

Octagonal Ingot

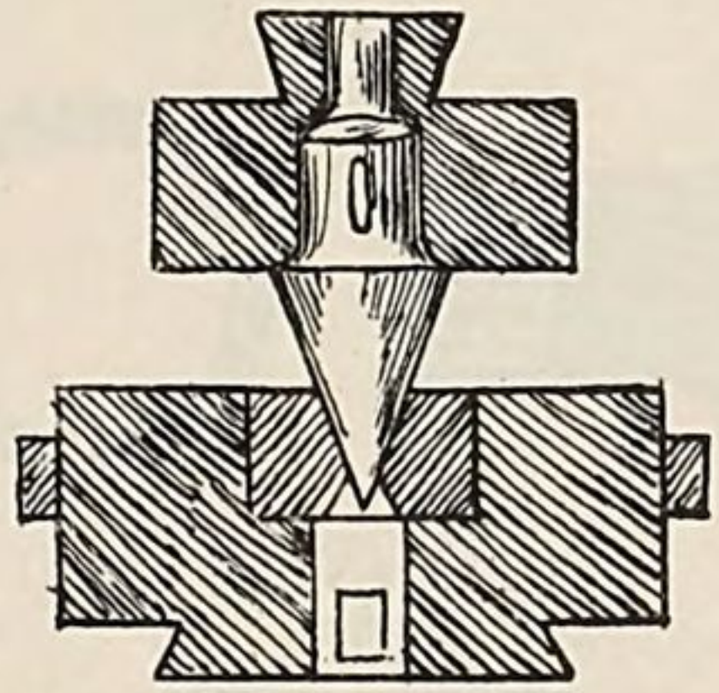


Fig 3

Conical punch for hammer

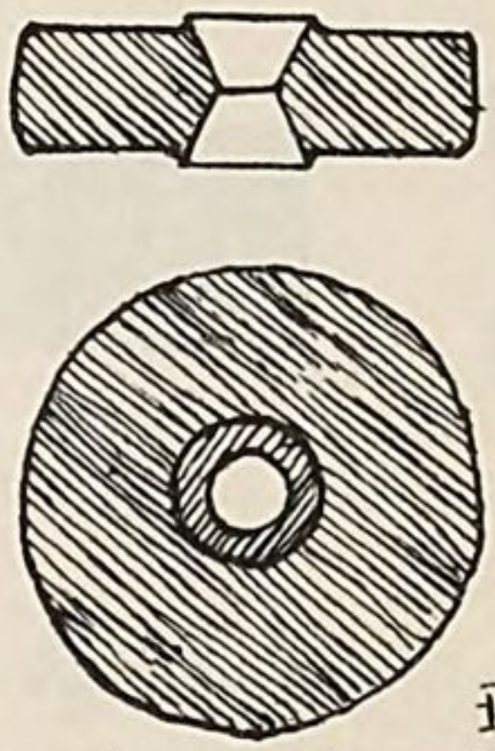
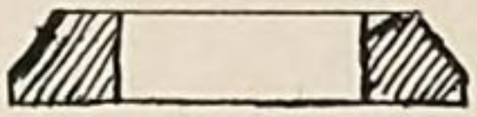
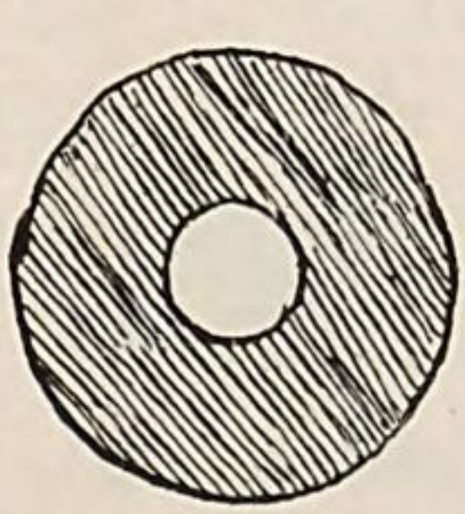


Fig 4

Disc pierced







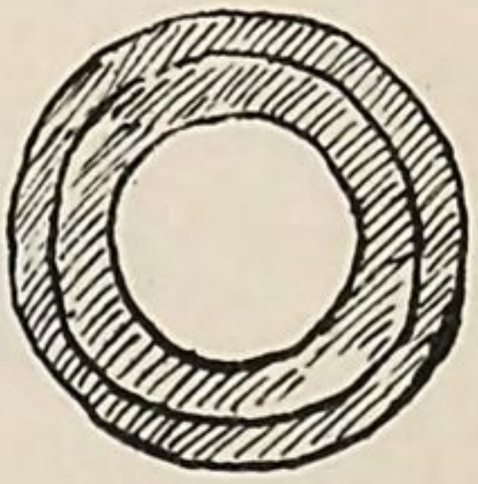


Fig 5 Ring punched

Fig 7 Ring hammered

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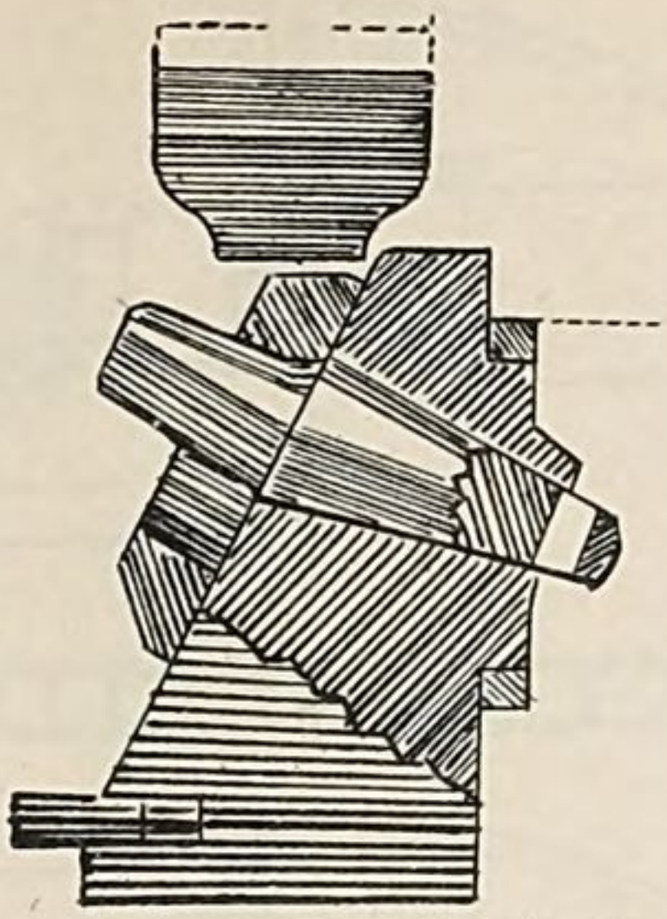


Fig 6

Inclined Anvil

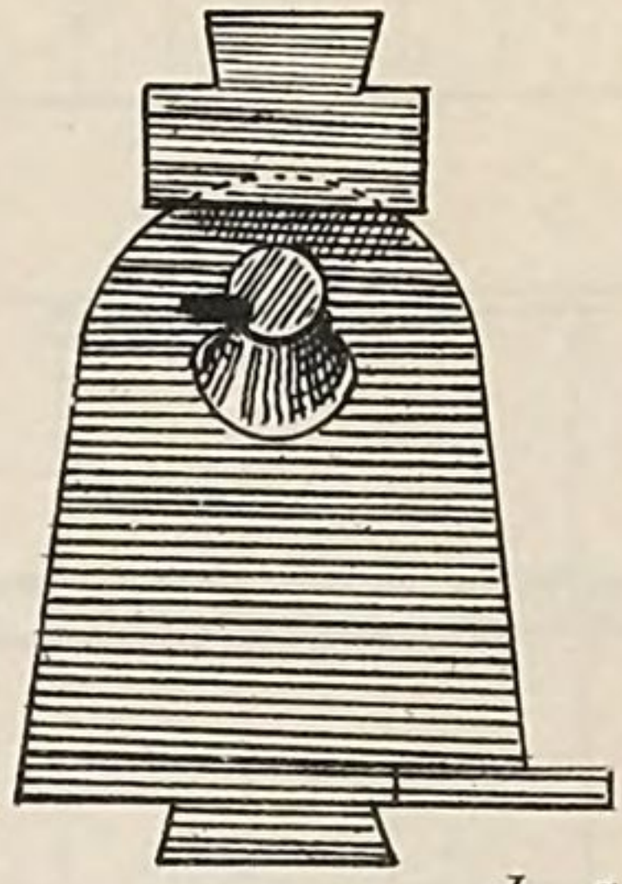


Fig 8

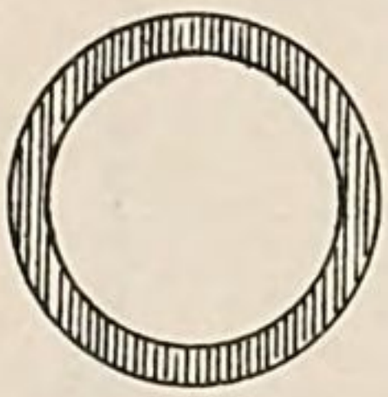
From the Revue

Fig 6

Fig. 7

Fig 8





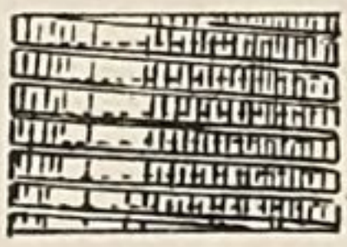






Fig 9



Fig 11

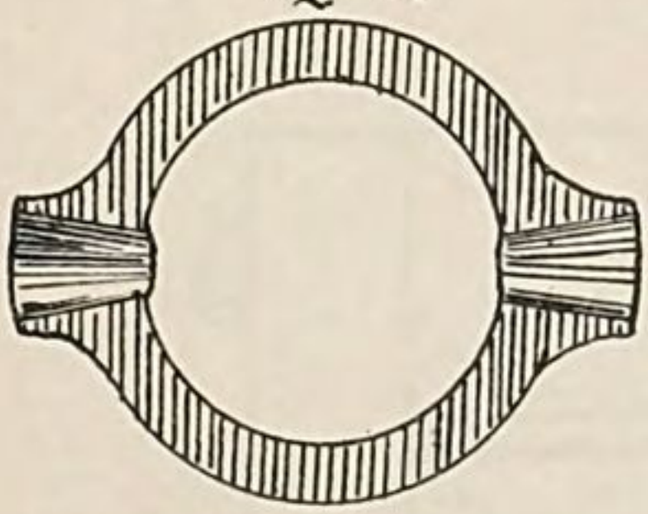


Fig 12



Fig 14

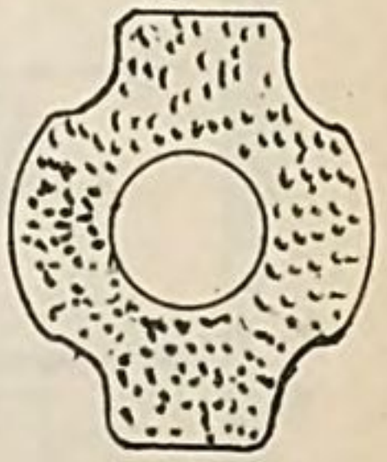
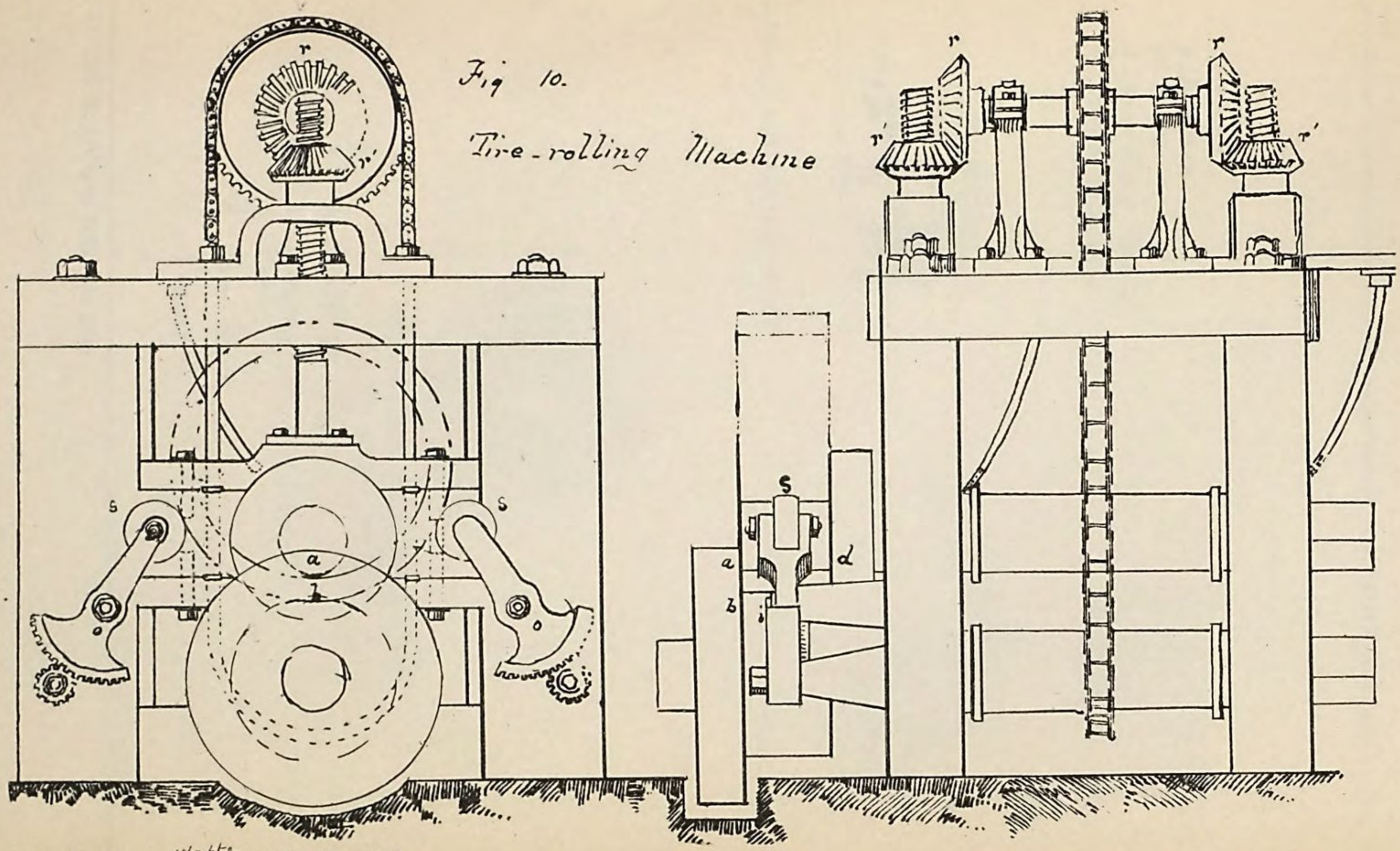


Fig 13



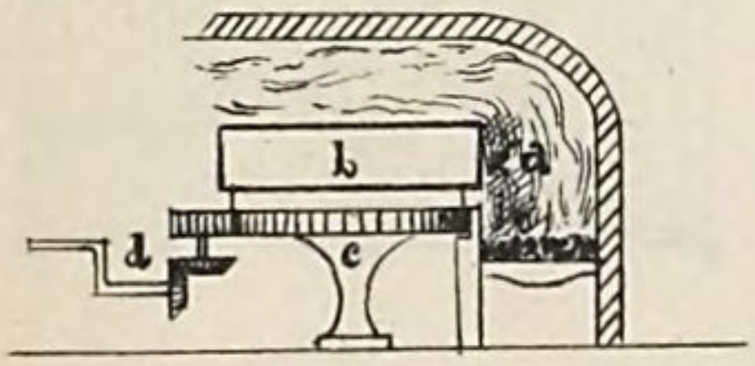
Fig 10.

Tire-rolling Machine

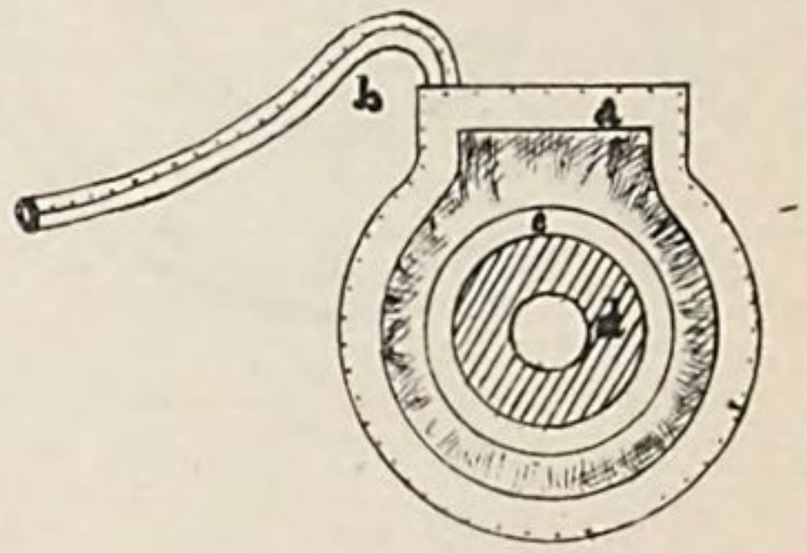


a._Furnace
b._Hoop
c._Revolving Table
d._Crank and gear

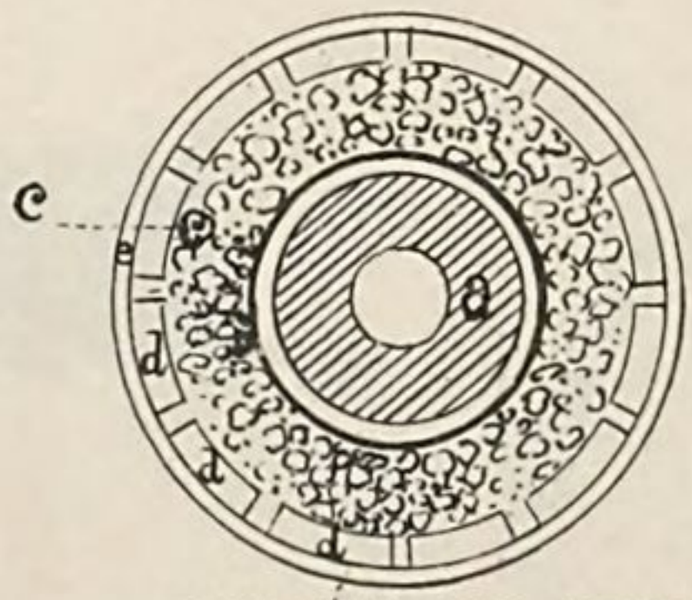
a._Watering Pot
b._Hose Pipe.
c._Hoop.
d._Body of Gun.



FURNACE FOR HEATING HOOPS



APPARATUS FOR COOLING HOOPS

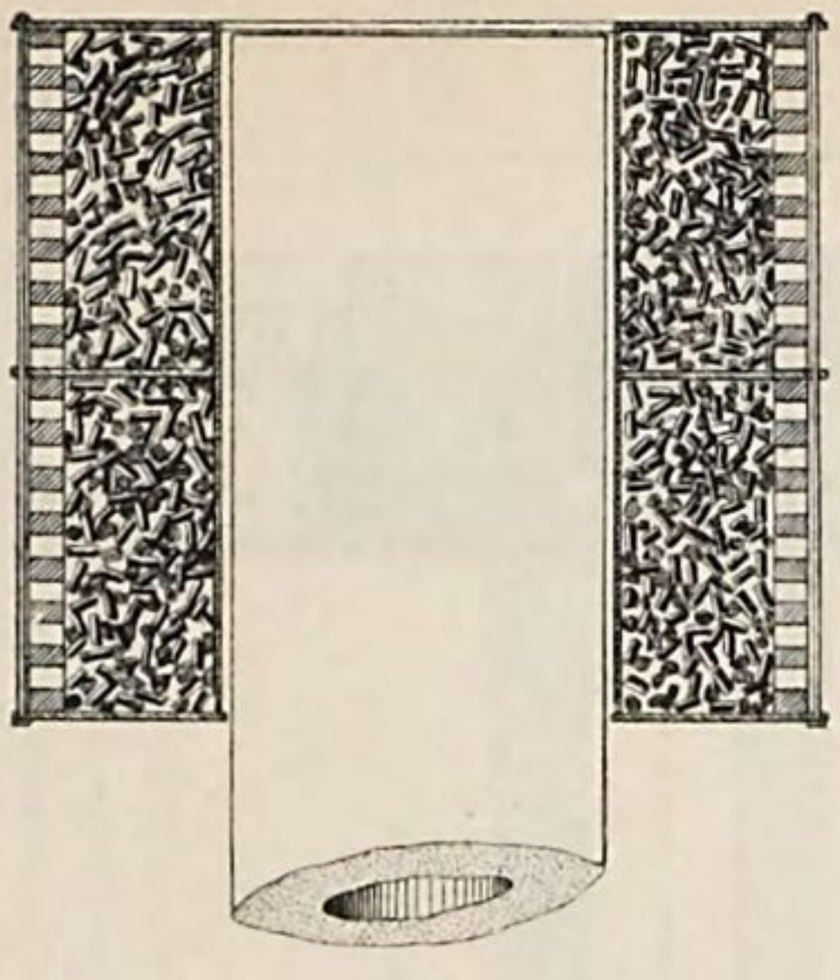


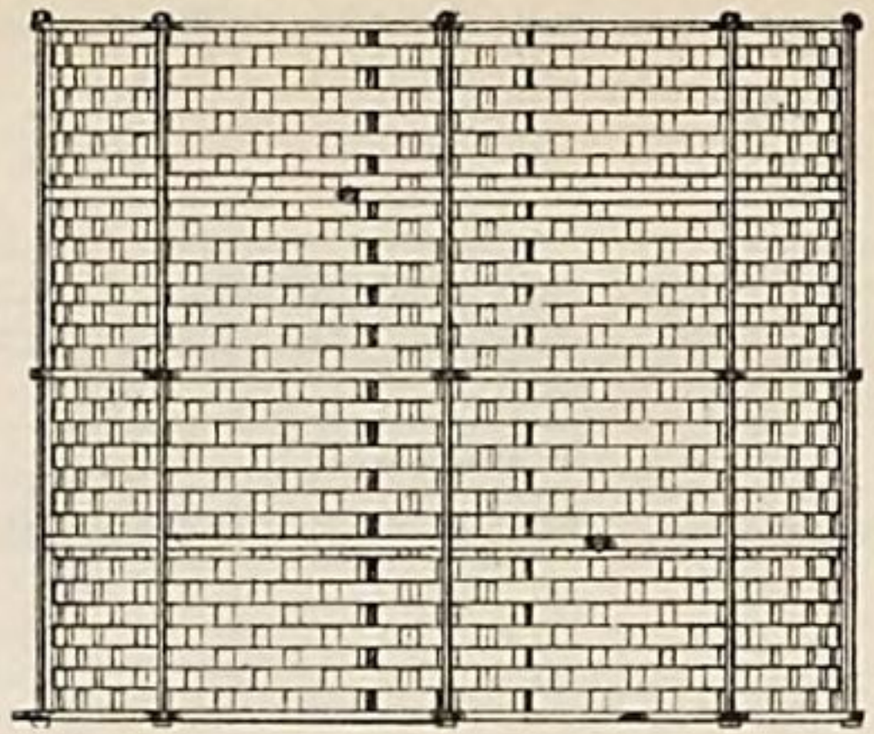
BRASIER FOR HEATING BODY OF GUN
TO INSERT LINING TUBE

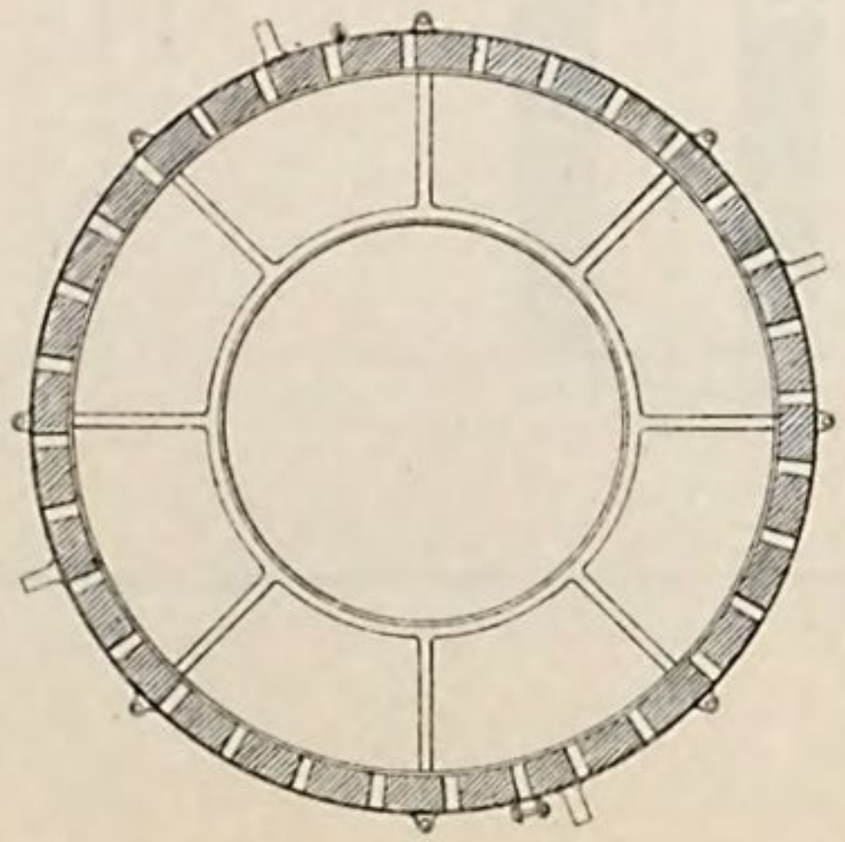
a._Body of Gun.
b._Lining of Furnace.
c._Coke.
d._Fire Brick
e._Frame.

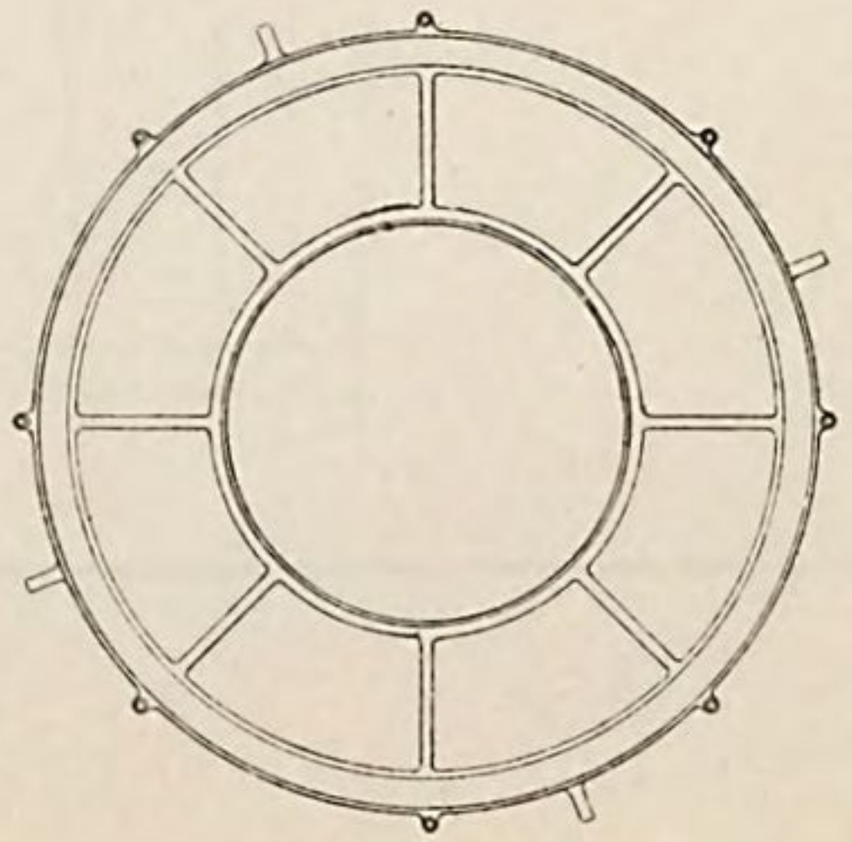
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BRASIER FOR HEATING BODY OF GUN TO INSERT LINING TUBE









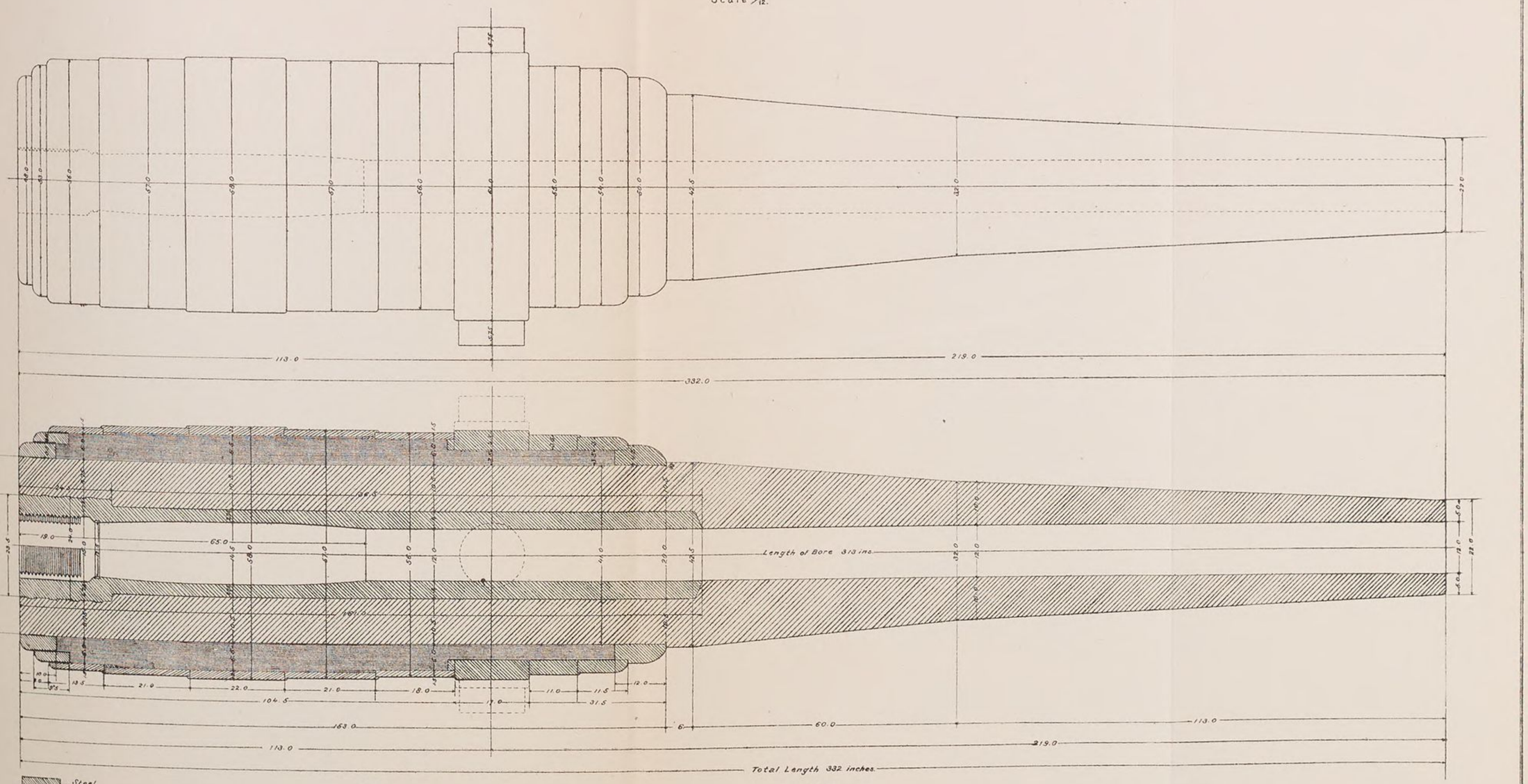
SEN. EX. DOC. No. 178 pt. 2 1st SESS.. 47th CONG.

PROPOSED 12-INCH B. L. RIFLE — 57 TONS.

Cast Iron Body Lined with a Steel Tube and Wrapped with Steel Wire.

Interrupted Screw Fermeture.

Scale 1/12.



Weights.

Steel Wire	29258 lbs.	Weight of Steel	50755 lbs.
" Tube	8750 "	Cast Iron	70250 "
" Breech Block	1018 "	Wrought Iron Hoops	7475 "
" Hoops	11689 "		
Total	50755 lbs.	Total Weight	128480 lbs.

LEGEND.

Steel Tube inserted into Cast Iron Body under shrinkage, Wire put on exterior under tension, and Hoops under shrinkage.

Charge
285 to 295 lbs.

Projectile.
750 to 800 lbs.

CHIEF ENGINEER GEORGE QUICK, R. N.

BREECH-LOADING ORDNANCE.*

J. REESE.

L. R., No. 25.] PITTSBURGH, *July* 12, 1881.

FRANK E. HOBBS, *Recorder*,
Army Building, New York:

DEAR SIR: I beg leave to call the attention of the Board appointed under General Orders No. 48, to "the basic process" for the manufacture of steel; and in order that the Board may understand the nature of the "basic process" and its advantages, I herewith send you copies of a paper read by me before the Engineers' Society of Western Pennsylvania, entitled, "The basic dephosphorizing process; what it is, and what may be expected from it." One hundred thousand tons per month is now being made by this process in Europe, and extensive arrangements are being made for its production in this country.

I think that the process is worthy of the serious consideration of the Board, in view of the production of superior cannon at low cost.

If I can be of any further service, command me.

Yours, truly, JACOB REESE.

L. R., No. 26.] PITTSBURGH, *July* 12, 1881.

FRANK E. HOBBS, *Recorder*,
Army Building, New York:

DEAR SIR: Relating to General Orders No. 48, I beg leave to call the attention of the Board to my process for the manufacture of steel cannon. (See document, War Department, part 1, 1872–'73, pages 433, 434, and 435.) The objection of the Board of 1872, "the excessive price," is now obviated, as the facilities for such work have been so much enlarged as to enable me to produce large cannon by my process at less cost than cannon of the same physical structure, or of any structure of equal service, can be produced by any other process known to me.

Please note that this is a *process* for producing the physical and chemical requisites in the physical structure of the metal, and has nothing to do with the form or mechanical arrangements of the gun, and the process may be applied to any steel gun you may adopt.

Yours, truly, JACOB REESE.

OFFICE OF THE BOARD ON HEAVY ORDNANCE AND PROJECTILES,
Army Building, New York City, August 2, 1881.

Mr. J. REESE, *Pittsburgh, Pa.:*

DEAR SIR: Your communications of the 12th ultimo have been considered, and I am directed by the Board to request that you make definite

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* The communication of Chief Engineer Quick and the accompanying drawings are not printed, since he desired the same to be considered as strictly confidential.

propositions to it, submitting plans, specifications, mode of construction, cost, &c., and state what kind of a gun you can make, how soon it can be made, what facilities there are for making a gun of large caliber of steel, made by the "basic process," &c. Have you the necessary plant to construct a 12-inch rifled gun by your method; and if not, what would be the cost of such a plant?

Very respectfully, your obedient servant,

F. E. HOBBS,
Second Lieutenant Second Artillery, Recorder.

L. R., No. 138.] PITTSBURGH, *August* 6, 1881.

F. E. HOBBS,
Recorder of the Board on Heavy Ordnance and Projectiles,
United States Army Building, New York:

DEAR SIR: Yours of the 2d at hand, requesting me to make definite propositions for the production of steel cannon by my process, and also to state what facilities there are for making a gun of large caliber of steel made by the basic process, &c.; and if no suitable plant exists, what would a basic plant cost with which a 12-inch rifled gun could be made.

My process for the production of steel guns is as follows:

For the construction of a 12-inch gun I cast a core ingot of crucible, Bessemer, or open-hearth steel, say 18 inches diameter, and of sufficient length. This ingot is then heated and hammered in oval dies until the metal is condensed, the diameter reduced to 14½ inches, and the texture is free from porosity, and a fine grain is secured to the depth of 2½ inches. This core is then turned down to 14 inches. A suitable mold of the configuration of the gun is prepared with a feeding-gate connecting with its base, and two auxiliary gates communicating with its trunnions. The core is placed in a furnace and heated to a bright temperature, the scale or oxide is scraped off, and the hot core is suspended in the center of the mold. Bessemer, or other steel, in a molten condition, is then run into the mold through the bottom gate.

When the metal has raised up to the trunnions, the molten metal is also caused to flow into the mold through the trunnion gates until the metal has raised into the sinking head at the top. At this juncture molten metal is also caused to flow into the sinking head until solidification takes place.

When the metal has become solid the mold is withdrawn, and a furnace jacket is dropped down over the gun. This jacket is of sufficient diameter as to leave an annular opening all around the gun of 6 to 12 inches. This jacket is provided with air and gas conduits leading to its base. When the jacket is adjusted gas and air are let in, combustion takes place at the base of the gun, and the flame ascends and escapes from the top. By regulating the combustion a uniform reduction of the temperature of the gun may be secured.

When the gun is cold the sinking head and gates are removed, the trunnions turned, the gun bored and rifled, and, if perfect, it is ready for service.

It will be observed that when a 12-inch hole is bored into the hammered core that there is left one inch of the hammered metal all around the bore, which will uniformly exhibit a close, dense, and homogeneous texture, not possible to be secured by any other method of construction known to me. You will also observe that the outside body of the gun

(except the trunnions) is not wrought by hammering or turning, and a uniform temperature of all sections is sustained during its manufacture, which is essential to secure a homogeneous structure, and which cannot be attained when the body of the gun is constructed by hammering. The core is thoroughly welded to the molten metal. This process of welding a hot solid to liquid metal by "teeming" is in daily practice in Pittsburgh in the manufacture of plow steel, the production of this class being over 12,000 tons per annum, and no difficulty occurs in making a perfect weld.

Personally I have no plant for the manufacture of steel at present, but there are plants in this country in which the core could be cast, hammered, and turned. And there is a plant which, with a small addition, the body of a 12-inch gun could be cast and finished, and I believe that arrangements could be made for the construction of a 12-inch rifled gun upon my process so as to be ready for testing within eighteen to twenty-four months from date of the order.

A plant capable of producing one hundred steel guns per annum could be put up at the Allegheny Arsenal in Pittsburgh for an expenditure of $1,000,000, which would be capable of producing either Bessemer or open-hearth steel, either by the old acid process or by the basic dephosphorizing process. In addition to the guns specified, this plant could furnish 25,000 tons per annum of steel castings for gun-carriages, shells and solid shot, &c.

At your cost I will be pleased to visit the different steel works of this country and give detailed report of their plants and capacity for making steel guns, and propositions for the construction of a 12-inch rifled gun, if such can be obtained from responsible parties having proper facilities for its construction. And if ordered at your cost I will furnish you at as early a day as possible full plans of a steel plant, and with detailed working drawings, specifications, and cost of same, with detailed cost of material and labor, together with an estimate cost of production of such guns and castings as you may designate.

In view of the revolution now pending in the metallurgy of iron and steel, arising from the discoveries in, and incident to, the basic dephosphorizing process, by the aid of which pure iron may be produced in a liquid state from any grade of pig-metal, and the iron may then be admixed in definite proportions with carbon or any other desired elements, it appears to me as exceedingly important that the government should possess a first-class metallurgical plant, with facilities for the production of steel cannon and steel castings necessary in mounting and operating them, in order that the whole matter of replacing the now worthless cast-iron guns with steel cannon capable of competing with foreign instruments may be constructed under the exclusive direction and knowledge of the Ordnance Department, and as a matter of economy this work should be performed in a time of peace.

JACOB REESE,
Metallurgical Engineer.

LIEUT. A. H. RUSSELL.

L. R., No. 166.] UNITED STATES ARSENAL,
WATERTOWN, MASS.,
October 5, 1881.

The BOARD ON HEAVY ORDNANCE, U. S. ARMY,
General G. W. Getty, President,
Army Building, New York, N. Y.:

GENTLEMEN: I forward by express a working model illustrating the use of a new loading-pan with the French system of fermeture for heavy ordnance.

This pan remains always within the breech, turns with the breech-plug, and it is left in such a position that the screw threads are protected when the breech-plug is withdrawn. This dispenses with the ordinary movable pan which has to be inserted and removed by hand.

The model shows a swinging tray to support the projectile, but it is obvious that the projectile can be inserted directly into the breech from the shot-hooks, just as it is inserted into the muzzle with muzzle-loaders.

This tray is often used to support a sliding pan, which is pushed with the projectile into the breech and removed before the breech-plug is inserted. The new pan, shown in the model, takes the place of this sliding pan.

Attention is invited to the automatic action of the breech-plug on the catch of the right-hand swinging tray when the breech-plug is drawn back.

The action of the breech-plug on the loading-pan is also automatic, the spring which secures the latter when the breech screw is withdrawn being released by the entrance of the breech-screw, leaving the pan free to turn with it. The loading-pan can be removed from the breech if necessary by pressing the spring and lifting the pan out.

Many guns, as at present mounted, have the cutaway portion of the interior screw at the bottom. To apply the new loading-pan in such cases, the gun need only be turned 180° on its axis to bring the threaded portion to the bottom, or, if preferred, two pans can be employed to cover the two lateral threaded portions, the gun being retained in its former position.

Drawings will be furnished if desired.

Very respectfully, your obedient servant,

A. H. RUSSELL.

L. R., No. 182.] UNITED STATES ARSENAL,
WATERTOWN, MASS.,
October 10, 1881.

Lieut. F. S. HOBBS, *Second Artillery, U. S. A.*,
Recorder, Board on Heavy Ordnance, &c.:

DEAR SIR: In obedience to your request of the 7th instant, I send herewith description and drawings of the loading-pan for use with the French system of breech fermeture.

Very respectfully, your obedient servant,

A. H. RUSSELL,
Lieutenant of Ordnance.

LOADING-PAN FOR HEAVY ORDNANCE.

This device relates to the French system of fermeture, so known. Under this system the breech is open in the axial line of the bore of the gun, and is screw-threaded and constructed together with a correspondingly threaded screw-plug for the latter to be directly inserted within the screw-threaded chamber of the breech, and then, by being turned therein, engaged and interlocked against accidental movement and escape. In the use of this system with guns of large caliber it is customary, in the loading of the gun, to insert a "pan" or "apron" to facilitate the entrance of the projectile and to protect the thread of the breech. After loading, the pan is removed and then the breech-plug is inserted and turned, locking and closing the breech.

The main purpose of the new device is to obviate the necessity of removing the pan before the breech-plug can be inserted; and to that end the pan is so constructed in itself and in combination with the breech-plug as to interlock with and become a part of the latter, and to turn with it as it is turned to lock it in place.

In addition to the above, mechanism is provided for holding or locking the pan against accidental motion within, and escape from the breech when the plug is removed, and in the construction of the breech-plug to automatically unlock the pan as it is inserted so that the pan may turn with the breech-plug.

The device is illustrated in the accompanying drawings, Fig. 1 being a view in perspective at the breech and open end of the gun, with the pan and breech-plug detached; Figs. 2 and 3, respectively, perspective views of the breech-plug and pan removed; Fig. 4, a longitudinal vertical section through the axial line of the bore of the gun, showing the breech-plug and pan in their position before the plug is turned to lock it in the breech, and showing also the catch which retains the pan. This figure also shows in section the swinging tray on which the breech-plug rests when removed from the breech, its only difference from the ordinary construction being in the incline *p* on the lever (pivoted at *r*), which releases the hook *t* from the catch *t'* on the gun. The ordinary construction is shown in dotted lines at *p*, but the incline causes the breech-plug to release the catch automatically as it is drawn back, and so allows the tray to swing to one side at once. Figs. 5 and 6 are cross-sections on the line *x x* of Fig. 4, the one with the breech-plug and pan in the position shown in Fig. 4, and the other with the breech-plug and pan after being turned to lock the plug within the breech.

In the drawings, A represents the breech portion of a gun. This breech is open at its rear end, *a*, along the axial line of the bore, and it has a female screw-thread, *b*, which is cut out in parallel lines making square-sided channels, *c*, which run in the length of the bore, leaving sections of the screw-thread between the channels *c*, one of which sections is at and along the lowermost part of the breech opening.

B is the breech-plug. This breech-plug has a male screw-thread, *f*, corresponding to the female screw-thread *b* of the breech opening, and along its length portions of the screw-thread are cut out, as at *g*, corresponding in position to the threaded sections *b* of the breech chamber, the whole so that the plug can be inserted directly within the breech opening, and then, by being turned, its threaded portions interlocked with the threaded portions of the breech, and thus the plug locked in place, all as in the ordinary system of French fermeture.

The pan or apron is shown at *h*. This covers the lowermost threaded section of the breech opening, and, as shown in Fig. 3, it is provided with

flanges, o o_2, at each end of the pan. The pan is also sloped to fit within one of the cut-out portions, g, of the screw-threaded breech-plug B, and thus it is adapted to be interlocked and engaged therewith. If necessary, the breech-plug is cut deeper at this point than for the other spaces, g, so that the top of the pan may come nearly or quite to the level of the bottom of the bore. The pan, placed as described, obviously protects the screw-threaded breech, in its portion covered by it, from injury when a projectile is inserted, and directs the projectile into the bore; and again, when the breech-plug is afterwards inserted, it interlocks with the breech-plug, so that when the plug is turned the pan moves with it, and, in substance, as if in one part and piece with it. It is thus seen that the necessity of removing the pan after the projectile is inserted is wholly obviated.

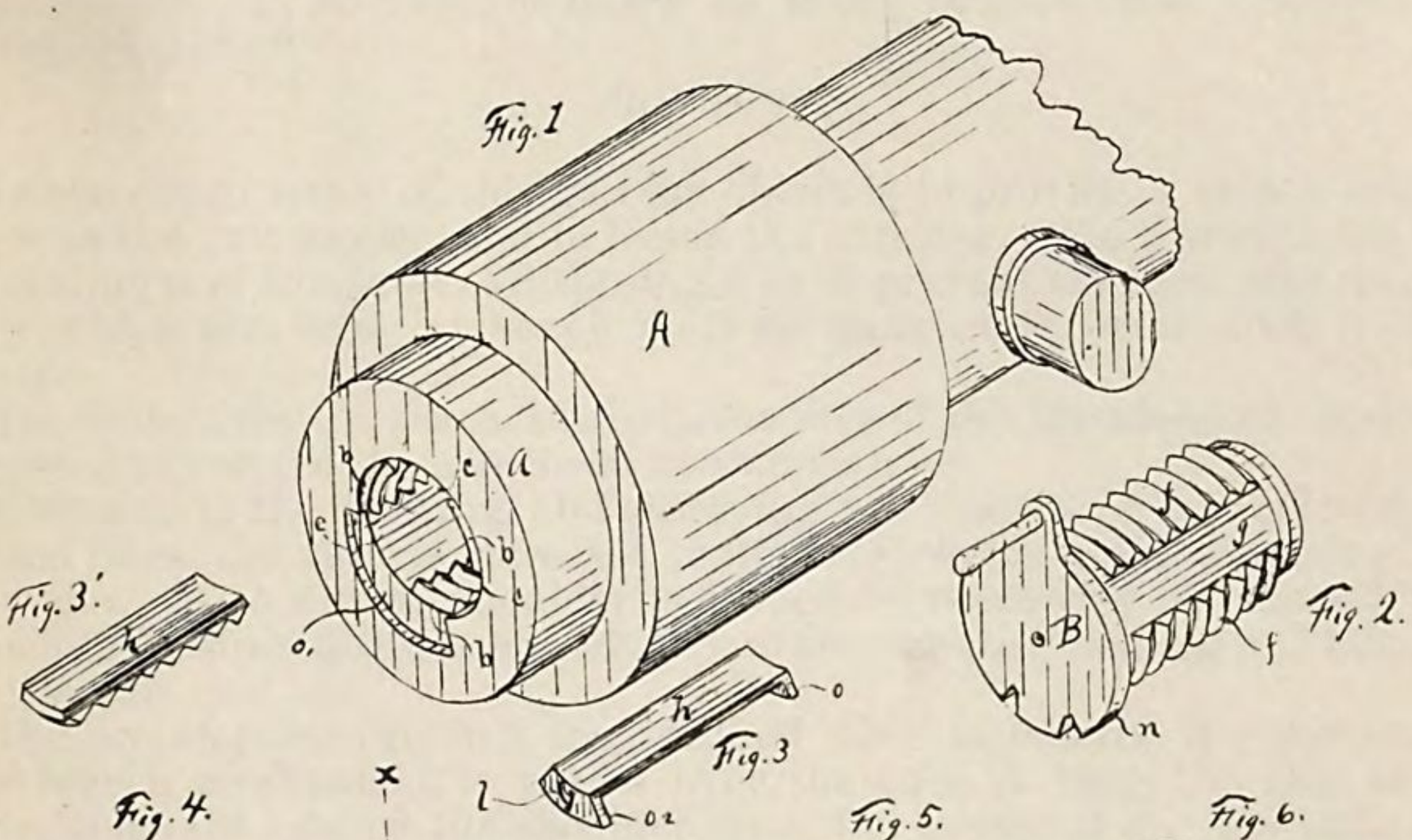
By the flange o the inner end of the pan interlocks with the screw-threaded breech at its innermost end, it being there suitably and correspondingly constructed therefor. The other flange, o_2, fits over and lies against the outer face of the end of the breech, and thus by it and the inner flange, o, the pan is held from movement along the length of the breech during the insertion of the projectile and of the breech-plug, while at the same time these flanges offer no obstruction to the turning of the pan with the breech-plug.

In Fig. 3′ the pan is shown with screw-threads on the under side, a construction which can be used if preferred.

Figs. 3 and 4 show the spring-catch l situated at the outer end of the pan, and there arranged and adapted to interlock with the notch m at the end of the breech. This catch l holds the pan from rolling within the open breech. The plate on the rear end of the breech-plug is made to project beyond the surface of the plug in such a manner that it strikes against the catch l as the plug is forced in, thus releasing the pan so that it can be turned with the plug. The breech can be recessed as shown at o_1, Fig. 1, for the rear flange, o_2, of the pan.

The notches n in Fig. 2 are made to receive the sides of the swinging tray P when the breech-plug is drawn back. The form of this tray is not shown entirely in the figures as it does not differ, except as above described, from that now in use.

It is obvious that when the breech-plug is out the pan can be readily and easily removed and replaced at pleasure, as the spring-catch can be operated by hand.



Loading-gear for heavy ordnance.

French system of Formetrie

W. H. Russell

Lt. of Ordnance, U.S. Army.

SEN. EX. DOC. No. 178 pt 2, 1st SESS., 47th CONG.

MASTER SAMUEL SEABURY, U. S. N.

[L. R., No. 110.]

*Descriptions of gun, projectile, fuze, and carriage submitted by Master Samuel Seabury, U. S. Navy, to Board on Heavy Ordnance and Projectiles, July 25, 1881.**

THE GUN.

In the construction of this gun my object is to provide a strong steel piece as the gun proper, and to lessen the expense of the trunnion-band by casting it of iron, and so disposing it as to prevent the loosening tendency which the firing of heavy built-up guns must exert upon their parts.

The inner tube, A, reaches only to the face of the breech-block, and is recessed to receive the gas-check at that end.

Referring to the drawing, and observing the allusion of the *note* to the dotted lines, the tube is increased in diameter at the point *a*, forming a shoulder. At *b* a small shoulder is formed by *decreasing* the diameter, which thereafter decreases gradually to the muzzle, forming the chase of the gun.

The breech-piece (given a longitudinal fiber to receive the thrust of the breech mechanism) is placed over the tube A from the rear and forced forward against the shoulder upon the former at *a*. The tube B is then placed over the tube A from the muzzle until the shoulder at its forward inner end takes against that on A at *b*.

This allows the tube B to meet the breech-piece at *a*, and to overlap it, so that in shrinking it is locked by the small shoulder at *c*.

Over the gun, as thus formed, the jacket-hoops are driven from the rear, separately, until checked by the shoulder *d*.

The outer surface of the jacket-hoops is then turned to a uniform diameter from *g* to *f*, and with an increasing diameter from *f* to *h*.

The cast-iron trunnion-band, with its inner surface bored to correspond with the conicalness of the jacket-hoops from *f* to *h*, is then passed over them from the rear, and set forward until firmly wedged.

This done, the-breech-band (from *g* to *f*), covering the seat of the charge, is placed over the cylindrical portion of the hoops, from the rear, and shrunk on so as to abut against the trunnion-band at *f*.

Considering the steel portion as the gun proper, it is evident that each discharge will tend to force it further into the trunnion-band before overcoming the inertia of the latter, while any tendency toward counter-recoil, if I may use the term, is prevented by the tightly-shrunk breech-band.

The charge, 80 pounds, may seem light in comparison with that proposed by Vavasseur (150 pounds) for a steel gun of the same caliber (*vide* "Wants of the Navy—Cannon," by Commodore Simpson, U. S. N., U. S. Magazine, July, 1880), but my object is to produce a light gun of large caliber, and I think I have proportioned the charge to the strength of wall.

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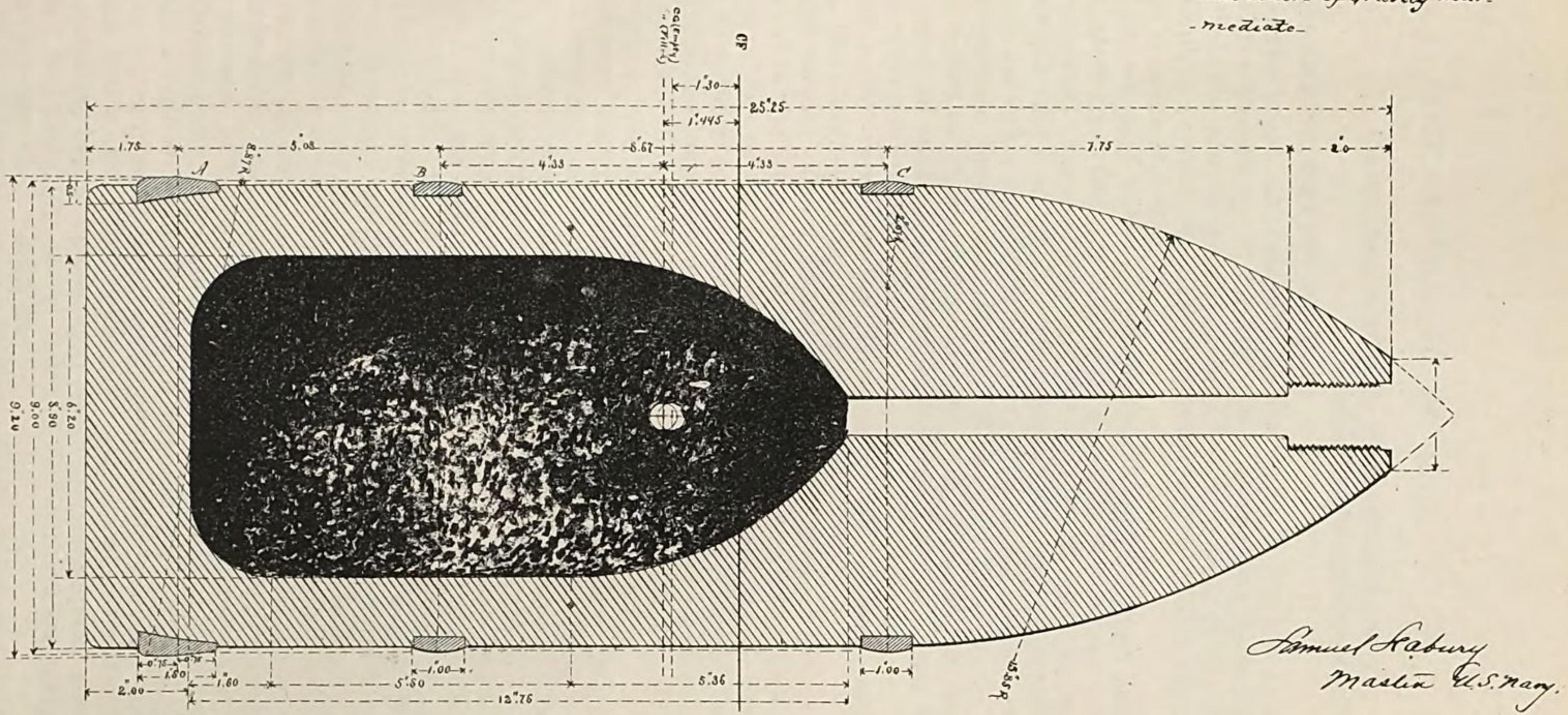
*The description of the fuze and carriage is not printed as the subject was not within the scope of the Board's investigations. See page 8, Report of the Board.

THE PROJECTILE.

In the projectile for the gun proposed, I have endeavored to illustrate an idea which, it seems to me, would increase the accuracy of fire, and that is, to place two centering rings or bands, B and C, upon the projectile so that the center of gravity shall fall equidistant, or nearly so, between them. This would allow the motion to be imparted without the jump which must follow the use of but one centering band, when the driving band A rides up the incline to the lands.

Of course, in charging a breech-loading piece, the projectile is supposed to be driven as far into the bore as the driving band will allow, but the bore *will* foul, and in case of a premature check from this cause, the sudden movement of the projectile up the incline, brings the soft metal of the driving band into violent contact with the *upper* incline, and destroys its form—the result, I infer, being inaccuracy of fire. With two centering bands this cannot occur, for the projectile, once in the gun, whether the driving band is exactly against the incline or not, is centered throughout its whole length, and that band strikes the incline, above and below, at the same instant.

11 in. B.L. Rifle Projectile with double centering bands and Centre of Gravity intermediate.



Samuel Kabury
Master U.S. Navy.

THE SECRETARY OF WAR.

L. R., No. 22.] ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, January 16, 1882.

The Honorable THE SECRETARY OF WAR:

SIR: I have the honor to inclose a letter from the President of the South Boston Iron Company, of January, 1882, requesting assistance in his efforts to "obtain proper government aid to enable me (him) to construct and complete a creditable ordnance manufactory in this country," and giving his reasons therefor.

It is a well-known fact that the proper facilities for heavy-gun constructions on modern types are not to be found in this country. The plant and mechanical experience are confined mainly to the casting and finishing of simple cast-iron guns. The preparation and manipulation of steel in large masses suitable for heavy ordnance are beyond the resources of our private foundries. But steel in some form must enter into the construction of guns, and constitute part, if not all, of the gun itself. At present all such steel has to be procured abroad, and is not always of the required quality.

Recently the breech-receivers for the 12-inch rifles, under contract, were rejected, the steel not being up to standard.

Constant and careful official supervision on the part of the government is essential to the attainment of uniform and reliable results in the production of any metal for gun construction, and particularly so with a metal so subject to variation as steel; but such supervision is only practicable in the foundries of this country. That we should not depend on foreign workshops for this indispensable material, but depend on home enterprise, is in accordance to the spirit of the laws.

The advantage of using steel exclusively in gun construction is apparent when European authorities claim that an all-steel gun, having a thickness of walls of one caliber, possesses greater strength than a cast-iron gun hooped and tubed with steel, having much thicker walls. This advantage over simple cast iron is still more signal as it admits of the production of a much lighter steel gun with superior power for the same diameter of bore. In the commencement of its manufacture, it would not perhaps be practicable to produce steel of a suitable quality in larger masses than are required for hoops or light tubes, such as are employed in France, Italy, and other European states where cast iron enters largely into the system of gun construction. For the production of the large ingots required in the manufacture of heavy steel guns abroad, steam-hammers are employed of 40, 60, and 100 tons weight, or hydraulic presses of thousands of tons power. Even with steel wire or steel riband guns, a system of construction that is now attracting the serious attention of artillerists in France and in England, the inner steel tube is required to be of very considerable size and weight.

There are but two ways to meet the case: 1st. By the establishment of a national foundry, being exclusively under governmental control; 2d. By assisting and fostering one or more of our private foundries, to enable them to prepare their plant, &c.

The South Boston Iron Company and the West Point Foundry are the only ones that have now any portion of the plant and experience. Both of these have made guns for the United States during the last

half a century, and have always given satisfaction. All the states of Europe, with the exception, perhaps, of Russia, are dependent upon private industry for the steel employed in the manufacture of their heavy cannon; and it is more than likely due to the aid and encouragement afforded them by government, that private establishments in Europe have attained to such celebrity in the quality of their productions. I have the honor to recommend that the attention of Congress may be called to this subject, so important to the defenses of the country.

The reference of this paper to the Board on Heavy Ordnance, now in session in New York, for an expression of its opinion, is deemed proper in connection with the duties devolving upon it, and is respectfully recommended.

Very respectfully, your obedient servant,

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

[First indorsement.]

Respectfully referred to Col. George W. Getty, President of the Board on Heavy Ordnance, New York City, for an expression of the opinion of the Board upon the subject presented by the Chief of Ordnance in this communication.

By order of the Secretary of War.

H. T. CROSBY,
Chief Clerk.

WAR DEPARTMENT,
January 18, 1882.

OFFICE OF SOUTH BOSTON IRON COMPANY,
Boston, January, 1882.

General S. V. BENÉT, U. S. A.,
Chief of Ordnance, Washington, D. C.:

SIR: With a view to enlist your sympathy and assistance in my efforts to obtain proper government aid to enable me to construct and complete a creditable ordnance manufactory in this country, I beg to call your attention to the following facts and my resulting proposal:

The South Boston Iron Company has been actively engaged in the manufacture of ordnance for the United States Government for more than half a century. During this long period of service its record has been of the highest character, and at all times it has faithfully executed its engagements with the government. It has added largely, from time to time, to its machinery and fixtures, until it is in condition to fabricate cannon of the largest caliber without delay, and until the value of its "plant" is more than a million dollars. I am aware, however, that such facilities as we have are entirely inadequate to the demand likely to be made for the armament of our Navy and for our coast defenses.

Desiring to continue the leading position we hold in the line of our business, and believing that we have the experience and ability at command to successfully produce cannon of large caliber of iron or steel from American ores, I beg to submit the following proposal and petition:

I propose to erect blast furnaces, steel-producing plant, steam hammers of large size, machine shops with facilities for finishing cannon of from 18 to 100 tons weight, at the rate of one per day, furnaces and rolling-mill for the manufacture of armor plates, foundry for the casting of guns and projectiles, and shops for the manufacture of gun-carriages.

The details of construction to be subject to the approval of the War and Navy Departments, with right to representation on the board of direction, the United States Government to have the right to take possession of the entire property at any time, at a fair appraisal of value, and to have the right to control the use of the entire works, at such rate of compensation as shall not exceed the percentage of profit heretofore paid for similar work.

I ask the government to furnish the means to make such additions, by the issue of a 3 per cent. 10-40 bond, of a similar character to the bond issued to assist the construction of the Pacific Railroad.

It is believed that the requirements of the government from such an establishment would insure our ability to meet the payment of the said bonds at maturity; and it is believed to be of the highest importance to the government to have such an establishment available, and that it cannot be obtained except by direct purchase or by some such encouragement as proposed.

The foregoing scheme is sketched to point out that the government may obtain the war material it so much needs at a proper cost; and at the same time enlist the watchfulness of private interest to develop the results of progressive invention until the establishment should become efficient and complete to the highest degree.

Very respectfully, your obedient servant,

WM. P. HUNT,
President.

L. R., No. 229.]

WEST POINT FOUNDRY,
Cold Spring, January 18, 1882.

General S. V. BENÉT, U. S. A.,
Chief of Ordnance, Washington, D. C.:

SIR: Mr. William P. Hunt has sent us a copy of his communication to you in regard to the establishment of a manufactory of ordnance with the aid of the government.

As we are the only other firm engaged in the business, we think proper to say that we coincide with Mr. Hunt's views, and that in our judgment there is no other way to create the necessary "plant" to manufacture such ordnance as is now required.

We would also say that having, like the South Boston Iron Company, furnished ordnance to the government for more than fifty years, and having, we believe, the confidence of the Ordnance Department, should it be decided to furnish means to establish a manufactory we would have equal claims on the patronage of the United States.

It would probably, however, not be deemed advisable to assist two establishments, and no doubt it would be considered best to do all the work in one.

Should this be the case, we would say that we think the interests of the West Point Foundry and the South Boston Iron Company could no doubt be consolidated on a basis which would be for their mutual advantage, thereby creating one establishment of large capacity, which would form an excellent basis on which to build up such a "plant" as is now required by the government.

It seems to us that such an arrangement would promote the interest of the United States as well as the manufacturers, and create a suitable "plant" in as short a time as the nature of the work will admit.

Very respectfully, your obedient servants,

PAULDING, KEMBLE & CO.

[First indorsement.]

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, July 19, 1882.

Respectfully submitted to the Secretary of War in connection with my letter on the same subject, of 16th instant, transmitting a letter from the South Boston Iron Company. I respectfully recommend that this letter be referred to the Board on Heavy Ordnance, New York.

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

[Second indorsement.]

Respectfully referred to Col. George W. Getty, President of the Board on Heavy Ordnance, New York City, in connection with previous papers submitted the 18th instant.

By order of the Secretary of War.

H. T. CROSBY,
Chief Clerk.

WAR DEPARTMENT, *January* 21, 1882.

OFFICE OF BOARD ON HEAVY ORDNANCE AND PROJECTILES,
Army Building, cor. Greene and Houston sts.,
New York City, January 24, 1882.

The ADJUTANT-GENERAL, U. S. ARMY,
Washington, D. C.:

SIR: This Board, to whom have been referred the letters of Mr. W. P. Hunt, President of the South Boston Iron Company, and of Paulding, Kemble & Co., proprietors of the West Point Foundry, to the Chief of Ordnance, asking governmental aid to enlarge the facilities of their establishments for the manufacture of large guns involving the use of steel, together with the letter of General Benét, transmitting the same with his views thereon to the Secretary of War, has the honor to present its opinion upon the subject set forth in those communications as follows:

For the past twenty years the demand for suitable naval and sea-coast armaments to meet the problem of national defense has taxed the mechanical skill and resources not only of the governmental authorities of the warlike powers of the Old World, but also of their leading gun-manufacturing establishments. During that period we have witnessed the advance of heavy ordnance from the 12 to the 100 ton gun, with corresponding increase in the weights of projectiles, while improvements in powder and the chambering of the more recent rifled cannon have permitted the use of charges so largely augmented as to add nearly one-half to the initial velocities of their projectiles. Whether or not a gun satisfactory in its method of construction and in the perfection of material used has been reached, there can be no doubt that valuable experience has been gained and very marked improvements arrived at from year to year. While the large establishments at Woolwich and at Elswich, on the Tyne, have been developing a method of built-up wrought-iron cannon on the English system, the vast Essen foundries have produced a steel breech-loading rifled gun of great power and strength, which has given to Herr Krupp a world-wide reputation.

France and Italy, in the mean time, have experimented, with more or

less success, largely in the use of cast iron and steel combined, for heavy ordnance, as a cheaper method of construction.

Though we have not the information to determine absolutely what will be the final method and material of construction adopted for heavy cannon as the resultant of past experience and progressive trials, it now seems probable that steel, by reason of its superior tenacity and limit of elasticity, will be largely used in the system of built-up guns.

In view of the great demand for heavy ordnance for our sea-coast defenses, involving the probable use of 2,000 guns for the most part of large caliber, and the insufficient preparation and development of the leading iron manufactories of this country for constructing heavy guns of other material than cast iron, it seems probable that any attempt on their part to meet the national demand without government aid will result in both material and financial failure.

This Board therefore concurs with the Chief of Ordnance in his views of the question of assisting some of our leading cannon factories to enable them to commence successfully the construction of a suitable armament for our sea-coast defenses.

GEO. W. GETTY,
Brevet Major-General, U. S. A., President of the Board.
Z. B. TOWER,
Colonel of Engineers, Brevet Major-General, U. S. A.
A. R. BUFFINGTON,
Lieutenant-Colonel of Ordnance.
F. H. PARKER,
Major of Ordnance.
JOHN MENDENHALL,
Major First Artillery, Brevet Colonel, U. S. A.

WEST POINT FOUNDRY.

L. R., No. 194.] WEST POINT FOUNDRY,
Cold Spring, N. Y., November 1, 1881.

Bvt. Maj. Gen. GEORGE W. GETTY, U. S. A.,
President of Board for examination of Improvements and Inventions in Heavy Ordnance, New York:

SIR: In accordance with the invitation in General Order No. 48, we beg leave to submit the following communication in regard to the construction of heavy ordnance.

We would premise that our views are the result of the experience we have had in the practical execution of the designs furnished us by the Ordnance Department and in our general business as manufacturers of heavy machinery.

We do not offer any new theory, and our object is to suggest certain modifications in the details of construction whereby the cost of heavy ordnance will be materially diminished, and guns may be made with greater rapidity with the limited plant which at present exists in the United States.

We do not ask that experiments shall be tried to test the accuracy of our views, we simply present them for the consideration of your Board for what they may be worth as a contribution to the general fund of information on the subject under investigation.

We inclose herewith drawing, marked No. 1, of a 12-inch breech-loading gun precisely like the four now in process of manufacture, with the exception that the cast-iron casing is in two pieces, screwed together.

In order to obtain the most perfect castings of these guns it has been deemed necessary to cast a great excess of metal on the chase, and the core or interior is to be only 14½ inches in diameter throughout the whole length. It is consequently necessary to melt 196,000 pounds, or 87½ tons of iron to cast a gun.

The finished weight of the casing is only 74,698 pounds, making a difference of 121,302 pounds, about 95,000 of which has to be reduced to chips by turning and boring.

If the gun is made in two pieces but little excess of metal would be required on the exterior and the form of the core or interior could safely approximate closely to that of the finished bore required for the wrought-iron tube and steel jacket.

About 140,000 pounds would be required to cast the two sections, and only about 40,000 pounds would be reduced to chips. There would consequently be a saving of 25 tons of iron on a 12-inch gun and probably one-third the cost of finishing of the casing, without taking into account the great cost of the preparations necessary to cast it in one piece.

We would also recommend that the tube and jacket be inserted in the casing of the breech-loading guns with a close mechanical fit, as has been the practice with the muzzle-loading converted guns, instead of the casing being shrunk on the tube and jacket as now proposed. This operation is very troublesome and expensive and there would be a considerable saving if it were dispensed with.

In our judgment the extension of the tube and jacket under the pres-

sure of the powder gas would bring a tension on the casing which would cause it to bear its proper share of the work, and the additional tension caused by the shrinking would not be necessary.

Drawing No. 2 is a design for a 12-inch breech-loading gun in which the wrought-iron tube is the same as in the four guns now under contract, but the exterior is modified to suit our idea of the form best adapted for screwing the two sections together, and the steel jacket is cylindrical throughout its whole length.

We would call the attention of the Board to the simplicity of the form of the breech-piece, which would be virtually a cylinder 53.5 inches exterior diameter, with a core 28 to 29 inches diameter, uniform throughout, and nothing could be better to insure perfect solidity and freedom for the strains resulting from unequal contraction.

But very little metal would be removed from the exterior and interior surface to finish it to the required dimensions, expense would be saved, and it is generally admitted by founders that the less metal removed from the surface of a casting in finishing the greater strength it will possess.

Simplicity of form is still more important in forgings of steel or iron than in castings, and the best metal is on the surface where it is exposed to hammering.

When a forging is irregular in form and there are shoulders or variations in the diameter it cannot be subjected to the same amount of heating and hammering in every part; its tensile strength, elastic limit, and other qualities are liable to great variation in different parts, and the whole mass cannot be relied on as regards uniformity.

In making the jacket of this gun, a simple cylinder which can be hammered very near to the finished dimensions, we employ steel in the most advantageous manner.

Drawing No. 2 also shows a breech-loading system invented by Mr. George Quick, an engineer in the British navy, with whom we have been in correspondence. He seems fully conversant with the subject, his design seems to have considerable merit, and we have thought therefore it would be of interest to your Board.

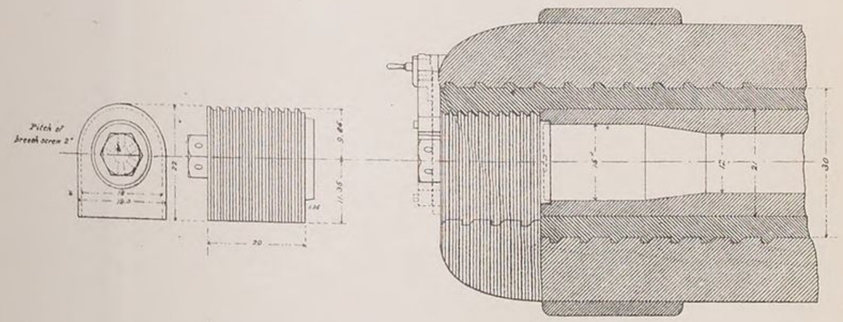
In this plan it will be observed that by means of the screw in the sliding-breech the gas check can be set forward or tightened at every discharge, and that the slide does not require the breech of the gun to be cut completely through as in the Krupp system—moreover that the breech of the gun would be considerably shorter than in the latter.

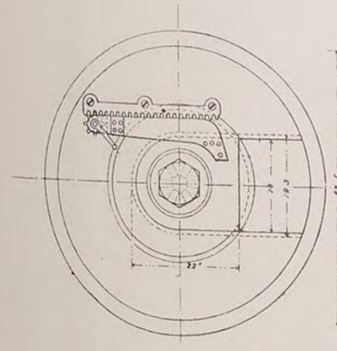
We would also remark that the design No. 2 would admit of the use of the French or Krupp fermature as well as the one invented by Mr. Quick. It is not a working drawing, but merely a design to illustrate our peculiar views and the fermature of Mr. Quick, and we have not thought it necessary for our present purpose to make careful calculations as to the strength of the various parts, &c.

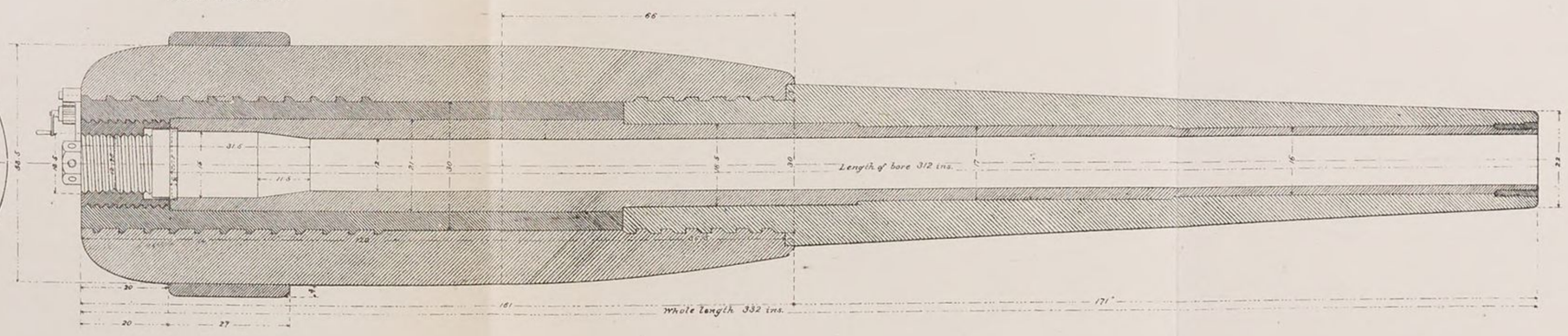
In conclusion, we would ask your attention to the improved Parrott projectiles for muzzle-loading guns, of which we inclose a drawing. We claim that they are fully equal to any other variety, and believe that they can be furnished at a lower price. We have made a considerable number of 8-inch caliber for the United States Navy during the last four years, and they have proved very satisfactory.

Very respectfully, your obedient servants,

PAULDING, KEMBLE & CO.







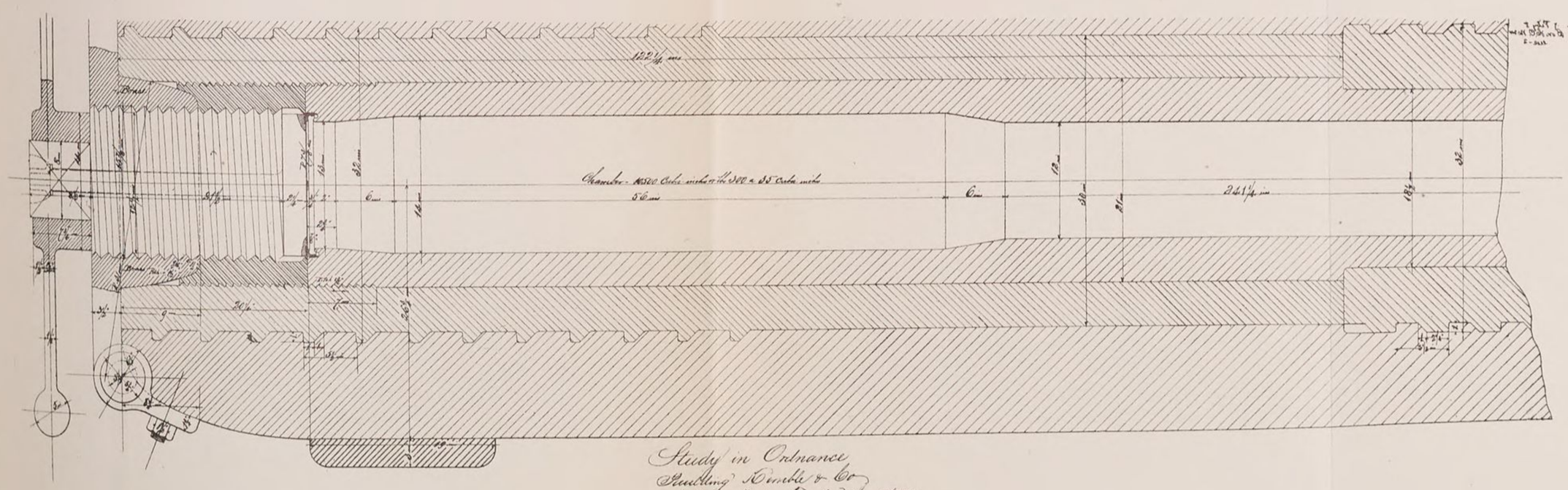
No 2.

12 in. B. L. Rifle

Cast iron casing lined with wrought iron tube
and Steel Breech Reciever
Slide piece fermeture

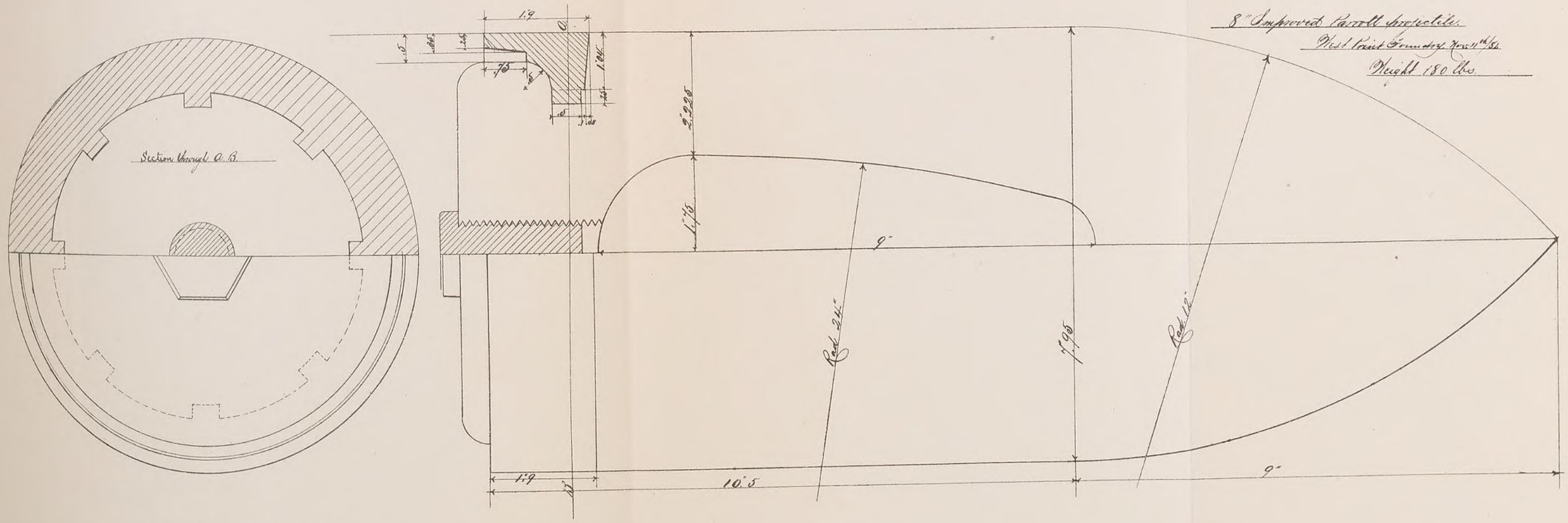
West Point Foundry
November 1880
Weight about

SEN. EX. DOC. No. 178 1st SESS., 47th CONG.



Study in Ordnance
Rendling Dimble & Co
West Point Foundry Jan'y 1882
Scale 3 cm - 1 foot

SEN. EX. DOC. No. 178 pt 2, 1st SESS., 47th CONG.



SEN. EX. DOC. No. 178 pt 2, 1st SESS., 47th CONG.

NORMAN WIARD.

L. R., No. 242.] WASHINGTON, *January* 2, 1881.

HON. ROBERT T. LINCOLN,
Secretary of War:

SIR: Acting for myself and as the duly authorized superintendent and general agent of the American Ordnance Company, I present for your consideration the following modifications of our proposal of the 28th of March, 1881, a copy of which is hereto appended. By these modifications we now propose to divide the experimental part of the operations under the previous proposal into *four parts*, with a view to obtaining specific results as the trial and proof progresses. So that one point of excellence of our proposed "armament," "heavy guns," "converted guns," and "*ordnance*" will be fully settled and determined before we begin with another, or involve the government in needless expense.

The *first part* of the experimental operations will begin with and include the furnishing by the party of the first part of powder (and the firing necessary to the selection of the desirable kinds to be used) in accordance with the terms of the original proposal of the 28th March, 1881, in article 16 and 18 for the two calibers to be tested in the first part of these experimental operations.

The best width and depth of the grooves, together with the best pitch of the rifling for these calibers with the original length of bores unchanged.

To thoroughly testing the *power* of the two calibers of guns referred to, *for the penetration of iron targets* and *of "earth-works"* when converted to combined rifle and smooth bores according to the plan specified in articles of specification for conversion "*third*" and "*fourth*" on the first page of the printed proposal of the 28th of March, 1881.

To apply and test the snubbing rope plan of restraining the recoil, and the test and record of the "initial velocities" of all the projectiles fired during *this part* of the experiments, with charges of powder varying from 50 to 100 pounds (being the service and battering charges) for the 15-inch caliber, and from 20 to 60 pounds, the corresponding charges for the 10-inch gun.

For this part of the experiments it will be necessary that the party of the first part, of which I am the representative, shall supply all the following in conformity with the terms of the specification in the original proposal, viz:

"The floating battery," of which the estimated cost is	$15,000
Two sections of the "iron targets," one (for the test of power of the 15-inch guns) to be composed of three 5-inch plates, 10,000 pounds each, 15 inches thickness of iron to be penetrated, to weigh about 30,000 pounds; one for the test of power of the 10-inch gun, to be composed of two plates, to weigh 20,000 pounds, assembled and set up, with strong wooden frame and backing, as specified in the original proposal, the estimated cost of which is	7,500
"Conversion" of four guns, together with the special tools and plant required	15,000
The application of "the snubbing rope plan" of restraining recoil, including original patterns and special appliances required for an original production and application	2,500
The experimental powder and special appliances for its production	5,000
"Steel," "chilled iron," and "spherical" projectiles, with patterns, chills, special tools, &c	10,000

Erection, materials and labor for; the renewal and repair of the "sand butt"	$5,000
Superintendence, labor, transportation, towing, photographing, and subsistence	7,500
Implements and unenumerated supplies	5,000
Incidental	2,500
Total	75,000

And it will be necessary that the War Department, party of the second part, shall, in addition to the money consideration, deliver to the party of the first part the following, viz:

Two 15-inch smooth-bore, uninjured Rodman guns of the best quality. Those cast at South Boston previous to 1868, and mounted in the fortifications without having been fired, are preferred, and in determining what particular guns are to be selected the experimenter stipulates that the official record of all the 10-inch and 15-inch guns cast at South Boston, and on hand, shall be open to his examination, from which, and upon an actual inspection of the guns, he will choose the experimental ones.

Two 10-inch smooth-bore Rodman guns to be selected as above, and four wrought-iron carriages, two for the 15-inch guns and two for 10-inch guns, one of each size to be supplied with the "pneumatic buffers" for restraining the recoil, and the others, without the buffers, will be supplied with the "snubbing rope plan" of restraining the recoil, as it is proposed to test the snubbing rope plan in competition with the "pneumatic buffers" throughout the experimental firing in this first part of the experiments.

It is to be noticed that the estimated cost of this *first part* of the experiments amounts to a total of $75,000. But as it is the desire of the party of the first part to retain in possession and ownership, after the experiments are over, the floating battery, the special tools, patterns, chills, appliances, and the ordnance specified in article 7 on page 4 of the printed proposal of the 28th of March, 1881, it is proposed, in accordance with the spirit of the terms of that proposal, to deduct, therefore, from the estimated cost of this part of the experiments, the sum of $25,000 (which it is plainly evident is a larger sum than could be realized from the sale of the same at auction after their use during all the experimental operations).

Therefore *the money consideration*, for this first part of the experiments which it is stipulated shall be paid by the War Department, will be only $50,000, which sum it is proposed shall be paid to the party of the first part by the Secretary of War, out of the appropriation (Public act No. 69, approved March 3, 1881), in the manner provided for in article 7 on fourth page of the printed proposal of the 28th of March, 1881, upon the "estimates" hereinbefore written, as materials or labor are furnished, ordnance supplied as specified, expenses are incurred.

After charging against each item 33⅓ per cent. for the ordnance, &c., above specified, which, as stipulated, is to be retained as the property of the party of the first part, in lieu of said 33⅓ per cent. of the cost as estimated, and 10 per cent. of the remainder from each payment, may be retained by the Secretary of War, as guarantee that the whole programme of experiments will be fully and faithfully executed; all the specified materials and labor furnished, ordnance supplied, and specified expenses incurred. And when this first part of the experimental operations are completed, in strict accordance with the terms of this amended proposal, all the balance remaining unpaid and withheld, of the full sum of $50,000 in money, in addition to the supplies and ord-

nance left over and retained by the party of the first part, shall be immediately paid to the party of the first part by the Secretary of War, which full sum of $50,000 shall be accepted by the party of the first part, as the full money consideration for this first part of the experimental operations for determining the power of the two specified calibers of guns after conversion; the most effective of the kinds of powder tested; the best modification of the rifling of the guns, and the merits of the snubbing rope plan for restraining the recoil of the guns, as specified.

The *second part* of the experiments are to be conducted for the purpose of testing, by rapid firing, the endurance of the previously specified two calibers of guns, 10-inch and 15-inch, after conversion, on the plan specified in articles 3 and 4, first page of the printed proposal of the 28th March, 1881, and for "trial and proof" of the 15-inch caliber by firing 500 rounds with deliberation, after the usual mode.

The trial and proof of endurance under "rapid firing," shall be conducted by firing the 15-inch gun with centered "mechanical-fit" projectiles, of at least 500 pounds weight each, and with service charges of improved powder—not less than thirty consecutive rounds in sixty minutes; and the 10-inch gun with centered mechanical-fit projectiles of not less than 250 pounds weight each, and with service charges of powder, not less than thirty rounds consecutively in forty minutes.

For the purposes of this experiment it will be necessary for the War Department to supply one 15-inch smooth-bore Rodman gun (or two, if one or either caliber shall be disabled before the experiments terminate), and one 10-inch smooth-bore Rodman gun (these to be selected from guns on hand in the manner previously provided for), and the party of the first part will convert the guns to combined rifle and smooth-bore, according to the plans specified in articles 3 and 4 of the proposal of the 28th of March, 1881, and the photographic page of drawings therewith, marked C, and will supply all the necessary powder, projectiles, implements, tools, materials, labor, transportation, &c., for all the experimental and proof-firing.

Five hundred and sixty rounds, it can be seen, will be fired in carrying out this part of the programme, and it is estimated that each round so fired will cost at least $100=$56,000.

The property left over after the experments, which, it is stipulated, shall revert to and become the property of the party of the first part, after the trial and proof is over, as is provided for in relation to these items, in the first part of the experiments, will not, it is believed, sell at auction for more than $6,000. Therefore it is proposed that the sum of $50,000 shall be the price fixed for conducting this second part of the experiments, to be paid by the War Department to the party of the first part in the same manner as is stipulated in relation to the first part of these experments, 10 per cent. as before to be reserved by the War Department as guarantee that the party of the first part will faithfully perform all the conditions required by the programme for this second part of the experiments.

The *third part* of the experimental operations shall be confined to the conversion, trial, and proof of power for the penetration of iron targets and earth-works, of two 15-inch smooth-bore Rodman guns into long-bore breech-loading rifled guns, such as are described in article 1 of the specification in the proposal of 28th March, 1881, and one 10-inch gun of the kind described in article 2, page 1 of the proposal, and automatic carriages for the same, one of the guns (15-inch) to be converted to a 15-inch caliber rifled gun, and one to be converted to a 12-inch rifled

gun as described, and for this part of the experimental operations one 15-inch and one 10-inch of the automatic carriages referred to in article 10 of the specification will be supplied by the party of the first part.

An iron target composed of six iron plates, each 5 inches thick, 10 feet long, and 5 feet wide, and one composed of four plates for the 10-inch guns, shall be furnished and set up for the experiments as described; being part of the target, equal to a weight of 100,000 pounds described in article 17 of the specifications in the proposal of the 28th of March, 1881.

The third part of the trial and proof will begin by experiments to adapt the powder to be used in these long bores and chambered guns to the increased cubical capacity of the bores of each, and will continue by a test of the power of a 15-inch, a 12-inch, and a 10-inch, *or an 8-inch gun*, of this kind, for the penetration of iron defenses, and earth-works; a test of each gun for initial velocity, range, and precision, with shot and shell, rifled and spherical.

The average facility afforded for rapid manipulation by the automatic carriages on which the guns will be mounted will also be thoroughly and practically tested; and on the completion of the trials three uninjured guns, in all respects like trial guns—one 15-inch, one 12-inch, and of 10-*inch or* 8-*inch* caliber, with an automatic carriage for each—will be delivered to the War Department.

To carry out this important third part of the experiments it will be necessary that the War Department shall supply to the party of the first part six 15-inch smooth-bore Rodman guns and two 10-inch smooth-bore Rodman guns, to be selected by the party ot the first part, in the manner provided for in the specifications for the first part of these experiments.

The party of the first part will convert two of the 15-inch smooth-bore guns into long-bored breech-loading rifled guns for trial guns, and all the proof firing will be performed with these; and when the proof and test firing is completed, and such modifications as the result of the trial and proof of these have been determined on, the party of the first part will proceed to convert the remaining four guns on the approved plan. These last to be simply submitted to the ordinary proof, for delivery to the War Department as tested but uninjured guns, in accordance with the terms of articles first and second, page one of the proposal of March 28, 1881.

The estimated cost of the conversion of these guns, eight in number altogether, will be—

At the rate of $5,000 per gun	$40,000
Five automatic carriages for same	25,000
100,000 pounds of iron targets, and erection of same	15,000
Powder and projectiles	5,000
Superintendence, labor, transportation, towing, photography, and subsistence.	5,000
Unenumerated supplies and incidental expenses	5,000
Total	95,000

It is believed that the trial guns, carriages, ordnance, and unexpended supplies left over, to revert to the party of the first part after this third part of the experiments are completed, would not sell at auction for more than $25,000. Therefore it is proposed that the money consideration for this third part of the experiments shall be $70,000, which sum it is proposed shall be paid by the War Department to the party of the first part, in addition to the supplies furnished and left over, which become the property of the party of the first part.

The fourth part of the experimental operations is intended to include

furnishing all the supplies and all the experimental operations specified in the proposal of the 28th of March, 1881, and not provided for in the previously specified three parts, and for this fourth part it is proposed that the War Department shall pay to the party of the first part the sum of $30,000, and when all the four parts of the experimental operations are fully completed as specified, and the five guns and carriages are delivered in the proposal of the 28th of March, 1881, all the balances reserved and unpaid of $200,000, being the total cost of all the series ot experiments, shall be promptly and fully paid to the party of the first part.

This amended proposal, it is to be noticed, provides for an additiona and expensive test by firing 500 rounds from a 15-inch converted gun not provided for in the proposal of the 28th of March.

This is intended to be in lieu of the competition firing of the guns lined with a tube made after Colonel Crispin's plan, and the Thompson, the Woodbridge, Sutcliff, and Mann guns, as specified in the first article of specification of consideration on the third page of the proposal of the 28th of March. But as all guns lined with steel or coiled and welded tubes are now acknowledged failures, it is believed that the War Department do not desire to have these guns fired at all. Nevertheless, if the War or Navy Department desire to use the floating battery, the unexpended iron targets and the appliances already provided for competitive firing between any guns in possession of either department, with any of the Wiard guns provided for in the proposal of the 28th of March, 1881, the party of the first part will cheerfully give consent to the use of any appliances in its possession at any period during the progress of the experiments, if the number of guns to be so fired shall not exceed five, and no charge will be made against either department for the use of such appliances if the departments furnish the powder and projectiles for all guns it may be proposed to experiment with.

If the first part of the experiments referred to in this amended proposal do not show that the 15 inch converted gun with its proper projectile and a powder charge not greater than one hundred pounds is fully capable of penetrating 15 inches of iron through and through, and the 10-inch gun with its proper projectiles of penetrating ten inches of iron with a powder charge of 60 pounds, then the second part of the experiments need not be proceeded with, and no further expense need be incurred by the War Department on account of the proposal of the 28th of March or of this amended proposal. But if the said gun should prove to have so much power or more, and if during the second part of the experiments the endurance of the guns of 15-inch and 10-inch caliber should be established by the trial and proof of rapid firing, then in that case the War Department shall put the party of the first part in possession of the 200 guns enumerated in the third, fourth, fifth, sixth, seventh, eighth, and ninth articles of specification in the first and second pages of the printed proposal of the 28th of March, and the party of the first part shall proceed to convert them as therein proposed in lots of 20 guns each, and the War Department shall pay to the party of the first part for such conversion, at the rate of $500 per gun, promptly upon the completion and delivery of each lot of 20 guns so converted until all the 200 guns are converted and paid for, and the Secretary of War shall recommend to Congress an appropriation of $800,000 for the conversion of 1,600 of the additional guns on hand at the same price, viz, $500 per gun.

But if either of such guns should burst during the trial and proof of

rapid firing during the progress of the second part of the experimental operations, then the Secretary of War may cause the further progress of experimental operations to cease before proceeding to the third part of the experiments, and no further expense against the War Department shall be incurred.

But if the first, second, and third parts of the experimental operations should all prove successful as showing the stipulated power and endurance of the various guns, and if the third part of the experiments shall show that the long-bored breech-loading gun converted from 15-inch smooth-bores shall prove to have power to penetrate 25 inches of iron or more, and if the long-bored breech-loader converted from a 10-inch smooth bore shall prove to have power to penetrate 20 inches of iron of the target, then in that case the fourth part of the experiments shall be proceeded with on the terms proposed.

All the practical operations connected with the experiments, from first to last, are to be conducted openly on the Potomac River, or its banks, near Washington, as at first proposed, and under the observation of such officers as the Secretaries of War and the Navy may detail to be present, witness the experiments, and record the results. But "it is stipulated that such officers" "are not to interfere with the experimentor, not even by advice." He is to be responsible to the Secretary of War alone.

Respectfully, your obedient servant,

NORMAN WIARD,
for himself, and
NORMAN WIARD,
Superintendent and General Agent
of the American Ordnance Company.

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312 SIXTH STREET, WASHINGTON, D. C.,
March 28, 1881.

Hon. ROBT. T. LINCOLN,
Secretary of War:

Norman Wiard, of Washington, D. C., acting for himself, and as the duly authorized superintendent and general agent of the American Ordnance Company, a corporation organized under the laws of the State of New York, party of the first part, proposes to provide armament for the sea-coast fortifications, heavy guns, carriages, projectiles, powder, implements, trial and proof, the necessary incidental expenses thereto, and to convert smooth-bore cannon into rifles, as provided for in the public act No. 69, approved March 3, 1881, according to the terms of the following specifications, and for the considerations hereinafter named.

SPECIFICATION "FOR ARMAMENT OF THE SEA-COAST FORTIFICATIONS," "HEAVY GUNS."

First. The party of the first part will produce by conversion and deliver to the War Department, after trial and proof, four long-bored breech-loading Wiard rifled guns, converted from 15-inch smooth-bore Rodman guns, supplied, as hereinafter stipulated, by the War Department from stock on hand, in the manner it has heretofore been the practice to supply smooth-bore guns for conversion. The plan of conversion to be followed is shown by tracings of drawings hereto attached, marked A and B. The drawing A shows a rifled gun of 15-inch caliber, converted from a 15-inch smooth-bore, and B a rifled gun of 12-inch caliber with

a chamber converted also from a 15-inch smooth-bore. One of each kind will be prepared, and after trial and proof the War Department may elect which of the two calibers shall be adopted for the four guns to be converted and delivered for armament of the sea-coast fortifications in the fulfillment of this part of the specification.

Second. The party of the first part will also produce by conversion and deliver to the War Department, after trial and proof, one long-bored breech-loading rifled gun, converted from a 10-inch smooth-bore Rodman gun supplied by the War Department. The general plan of conversion to be followed will be the same as shown by one of the drawings A or B, and the War Department may elect whether the rifled gun shall be of 10-inch caliber when delivered, or of 8-inch caliber with a chamber, after the trial and proof of the guns converted from 15-inch smooth-bores previously specified has terminated.

The parties making this proposal stipulate that they will generally follow the plan of conversions shown by the drawings, but that such modifications of the details may be adopted during manufacture, conversion, or progress of the trial and proofs, as in the judgment of the inventor may be deemed advisable.

SPECIFICATION FOR CONVERSION OF 200 SMOOTH-BORE CANNON INTO RIFLES.

Third. The party of the first part will convert one hundred 10-inch smooth-bore Rodman guns, to be supplied by the War Department in the manner heretofore stipulated—with regard to the guns previously referred to—into muzzle-loading "Wiard combined rifle and smooth-bore guns," by rifling them with three grooves each, after the plan shown by the drawing hereto attached and marked C. These guns after conversion will be adapted to the dimensions of the casemates of the forts, the carriages, implements, and spherical projectiles on hand.

Fourth. The party of the first part will convert fifty 15-inch Rodman smooth-bore guns into "Wiard muzzle-loading combined rifle and smooth-bore guns" of 15-inch caliber, according to the plan shown by drawing C, adapted to carriages and spherical projectiles on hand.

Fifth. The party of the first part will convert ten Parrott 10-inch rifled guns into 11-inch Wiard-Parrott muzzle-loading combined rifle and smooth-bore guns.

Sixth. The party of the first part will convert ten 8-inch Parrott rifles into 9-inch Wiard-Parrott muzzle-loading combined rifle and smooth-bores, by rifling them in the same manner.

Seventh. The party of the first part will convert ten Parrott 100-pound rifle guns into 7-inch Wiard-Parrott muzzle-loading combined rifle and smooth-bore guns.

Eighth. The party of the first part will convert ten of the guns heretofore converted into 8-inch rifles from 10-inch smooth-bores, by lining with a tube (after Colonel Crispin's patented plan) into 9-inch Wiard-Crispin muzzle-loading combined rifle and smooth-bore guns.

Ninth. The party of the first part will convert ten smooth-bore 8-inch Rodman guns into Wiard muzzle-loading combined rifle and smooth-bore guns of 8-inch caliber. All the guns referred to in articles of specification from fifth to ninth, will be adapted after conversion to carriages on hand and to spherical projectiles.

SPECIFICATION FOR CARRIAGES.

Tenth. The party of the first part will manufacture and supply four wrought-iron automatic carriages with all the machinery and appliances

thereto belonging, as shown by the drawing hereto attached and marked D, for and adapted to the four long-bored breech-loading rifle guns referred to in the first article of specification in this proposal.

Eleventh. The party of the first part will manufacture and supply one wrought-iron automatic carriage with all the machinery and appliances thereto belonging, as shown by the drawing attached hereto marked D, for, and adapted to, the gun referred to and described in article "second" of specification in this proposal.

Twelfth. The party of the first part will make all the repairs, modifications, adaptations, and additions to the carriages supplied as stipulated hereinafter by the War Department, for mounting the Thompson, Sutcliffe, Mann, Lyman, and Crispin gun for competitive trial and proof, and set up one of the carriages on the floating battery, for the trial or proof of a gun, and supply and apply the snubbing-rope plan for restraining recoil, made in accordance with the drawing attached hereto marked E, and will supply the floating battery built according to the design shown by the drawing attached hereto marked F, for use during all the operations of trial and proof.

SPECIFICATION FOR PROJECTILES.

Thirteenth. The party of the first part will manufacture and supply forty chilled iron, spiral triangular, subcaliber, centered projectiles, and two tempered steel punching shot, for trial and proof of each of the different calibers of the guns above specified;

Fourteenth. Five spiral triangular shells for each different kind and caliber of gun; and,

Fifteenth. Five spherical shells for each different kind and caliber of gun.

SPECIFICATION FOR POWDER.

Sixteenth. The party of the first part will furnish all the powder of various form, size, and density of grain required—not less than ten different sizes of grain, not less than five different densities, and not less than four different forms of grain—with a view to adapting the powder to the various calibers and capacities of the bores of the guns, so far as practicable, to secure the highest velocity to the projectile with the least strain upon the gun.

SPECIFICATION FOR IMPLEMENTS AND NECESSARY INCIDENTAL EXPENSES.

Seventeenth. The party of the first part will supply all the implements required for trial and proof of the guns referred to above (except a Le Boulenge chronograph), batteries, conducting-wires, screens, the necessary indenting instruments adapted to the different calibers of guns for determining the pressure of powder, including laborers' and mechanics' tools, screw and hydraulic jacks, chains, rope, tackle, small boats, barges, and lighters, and provide for all the necessary expenses attending the procurement of transportation, labor, materials, subsistence and ordnance stores, including an iron target, to be composed of twenty-four iron plates, each to weigh about 10,000 pounds, to be each 10 feet long, 5 feet wide, and 5 inches thick, to be set up on the bank of the Potomac River near Washington, firmly bolted together and attached to a strong frame of wood, as shown by the drawing herewith, marked G. The aggregate weight of the iron plates of the target will be about

240,000 pounds, and in joining them together three inches of wood will be sandwiched between the plates. The target will present 300 square feet of front surface, of which 100 square feet will be 30 inches of solid iron in thickness, 100 feet 20 inches thickness, and 100 feet 10 inches thickness.

SPECIFICATION FOR TRIAL AND PROOF.

Eighteenth. The party of the first part will mount the guns on the floating battery, and subject them to trial and proof in the following manner, viz: one of each kind and caliber of gun referred to in this proposal will first be fired the necessary number of rounds, using its proper projectile, and with charges of powder, of different sizes, densities, and form of grain, to determine which of the various kinds tried gives the highest velocity to the projectile, with the lowest strain upon the gun; beginning with the largest grains and greatest densities, and testing powder of reduced density and size of grain in succession, till the proper constitution of the charge is determined to the satisfaction of the inventor of the gun, or the person, or persons, who may have it in charge. Second. A few rounds with the selected powder and approved projectiles to determine the average initial velocity of the projectile, and its average penetration in sand, gravel, or earth. Third. Not less than ten rounds at longer range, to determine the relative precision. Fourth. One, two, or more rounds at the iron target, to determine the power of the gun for the penetration of iron defenses, and to determine the relative value of chilled iron, and steel shot. Fifth. From two to ten rounds for range. Sixth. From two to ten rounds with shells of the spherical kind, and an equal number of rifled shells. Seventh. For "proof," thirty consecutive rounds fired with the greatest practical rapidity. A complete record of all the firing, as to initial velocity, power, range, precision, rapidity of fire, character of powder, projectile, carriage, implements, objective point, and general result, witnesses present and all the conditions usually recorded as fully as possible in writing, as well as by photography, all to be certified to officially, so that the reviewing authority and all persons interested may have full information of the progress and results of trial and proof, and that all necessary and useful information may be recorded for the use of the government, and parties interested in ordnance.

SPECIFICATION OF CONSIDERATION.

First. The War Department, party of the second part, shall supply all the guns and carriages specified and necessary for mounting the guns produced wholly or in part by conversion, for armament, and heavy guns, as well as those provided by conversion for trial and proof for armament, in the casemates or *en barbette*, including "one improved breech-loading 12-inch rifled gun," one gun converted from a 15-inch Rodman smooth-bore, and two converted from 10-inch Rodman smooth-bores by lining with a tube, after Colonel Crispin's patented plans; one 8-inch rifled breech-loader, converted from a 10-inch smooth-bore, after Colonel Crispin's patented plans; one Thompson breech-loading 12-inch rifled gun, one Woodbridge gun, one Sutcliffe gun, and one Mann gun, all of the largest calibers on hand, together with the carriages which have to be altered, improved, or modified, and such as may be necessary for mounting the guns, to be mounted on the floating battery for trial and proof.

Second. The War Department shall furnish all the projectiles of "expanding kinds" required, and the necessary quantity and quality of powder for the trial and proof of all the guns, breech and muzzle loaders—other than those rifled or converted according to the Wiard system—in such manner as may be approved or designated by the inventors of the guns, or the War Department.

Third. The War Department shall direct the board, which is to be appointed by the President, under the act approved March 3, 1881 (Public No. 69), to be present, take cognizance of, inspect and record all the supplies and the operations and selection of guns to be manufactured into armament, including heavy guns, and guns to be converted or subjected to trial and proof; to take cognizance of, record and report all the operations connected with the production of guns, conversion of guns, carriages, projectiles, powder, implements, transportation, labor, trial and proof of all the guns referred to in this proposal.

Fourth. The War Department shall supply for use during trial and proof a Le Boulenge chronograph, and detail one or more approved officers to be present, to take and record the velocities of all the shots fired during the trial and proof.

Fifth. The War Department shall give permission and authority to enter upon the land of the reservation at or near Fort Foote, on the bank of the Potomac, near Washington, for the landing of materials, workmen, &c., for the erection of targets, quarters, bomb proofs, magazines, &c., and its occupation during the time of preparation for or continuance of trial and proof, with ample time afterwards for the operations of removing the same, and restoring the grounds practically to their original condition, if necessary.

Sixth. If it shall be found from an examination of the facts of the reports, unqualified by mere opinions, that the guns provided by the party of the first part are more powerful, have equal or better endurance, are susceptible of being fired more rapidly, and are cheaper than any others of like caliber submitted to trial and proof, or known to the War Department, the facts shall be submitted to Congress for its information.

Seventh. As a full consideration for the ordnance supplied, materials furnished, money and labor expended by the party of the first part, the War Department shall cause to be paid to the party of the first part the sum of $300,000, which money shall be paid in the usual manner, as work is performed, deliveries made, materials or ordnance supplied, or expenses incurred upon estimates; and when the trial and proof has been completed, and the two hundred and five heavy guns for armament, including converted guns, have all been delivered in accordance with the terms of agreement, all the balance of the aforesaid sum of $300,000 shall be immediately paid over to the party of the first part; and, in addition thereto, the floating battery, all that is left unused and unexpended of targets, projectiles, implements, materials, ordnance, burst guns, or *débris* of the same, or guns and cannons converted, altered, or *débris* of the same, or provided by the party of the first part, shall be turned over to or remain the property of the party of the first part, to be used or disposed of according to his discretion.

Respectfully, your obedient servant,

NORMAN WIARD,
for himself, and
NORMAN WIARD,
Superintendent and General Agent,
of the American Ordnance Company.

(First indorsemsnt.)

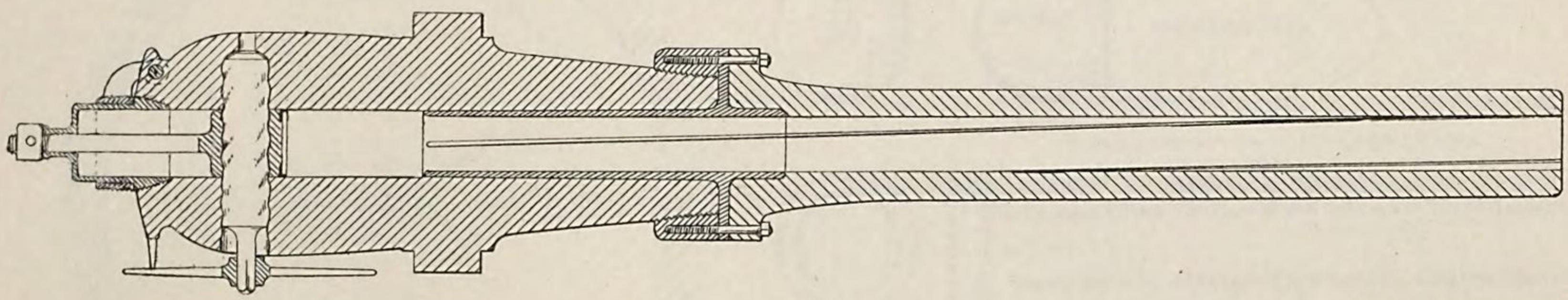
WAR DEPARTMENT,
ADJUTANT GENERAL'S OFFICE,
February 3, 1882.

Respectfully referred to the Board on Heavy Ordnance and Projectiles, in connection with the former proposal from the same inventor, bearing date March 28, 1881, now under consideration of the Board, with instructions to take this proposal into consideration, and with the suggestion that, if the within proposal in its present form shall be regarded as objectionable for any reason, reasonable modifications proposed by the Board would no doubt meet the favorable consideration of the inventor.

By order of the Secretary of War.

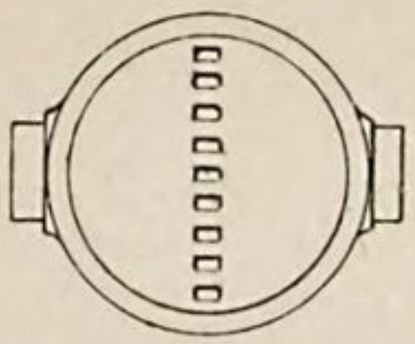
R. C. DRUM,
Adjutant-General.

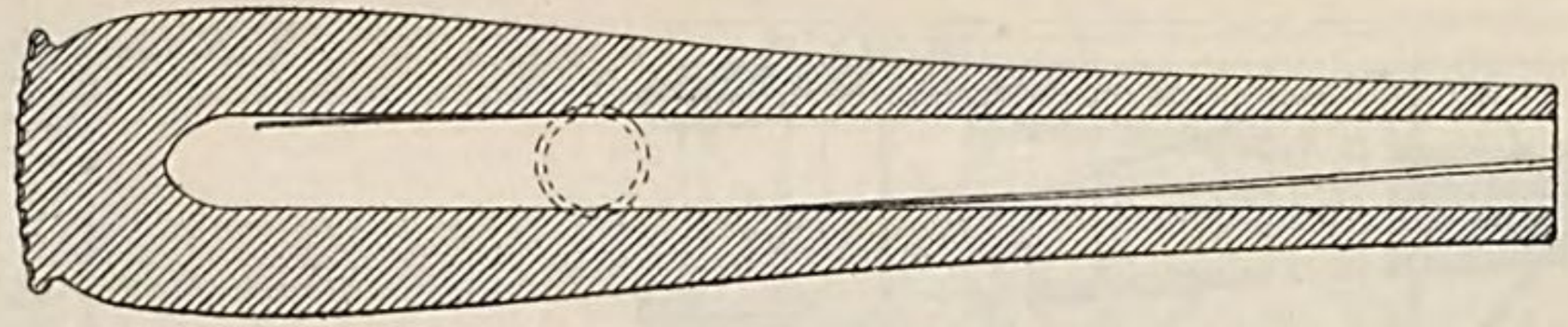
Norman Wiard's long Chambered Breech-Loading 12 in Rifle gun
with steel lining and cast-iron chase - Improved - Converted from a Rodman 15 in S. Bore.

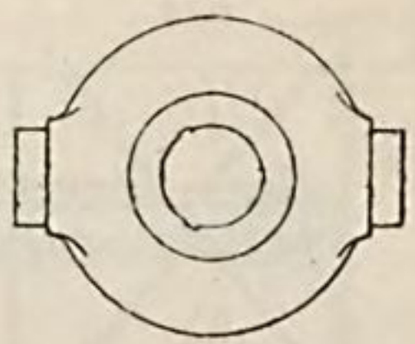


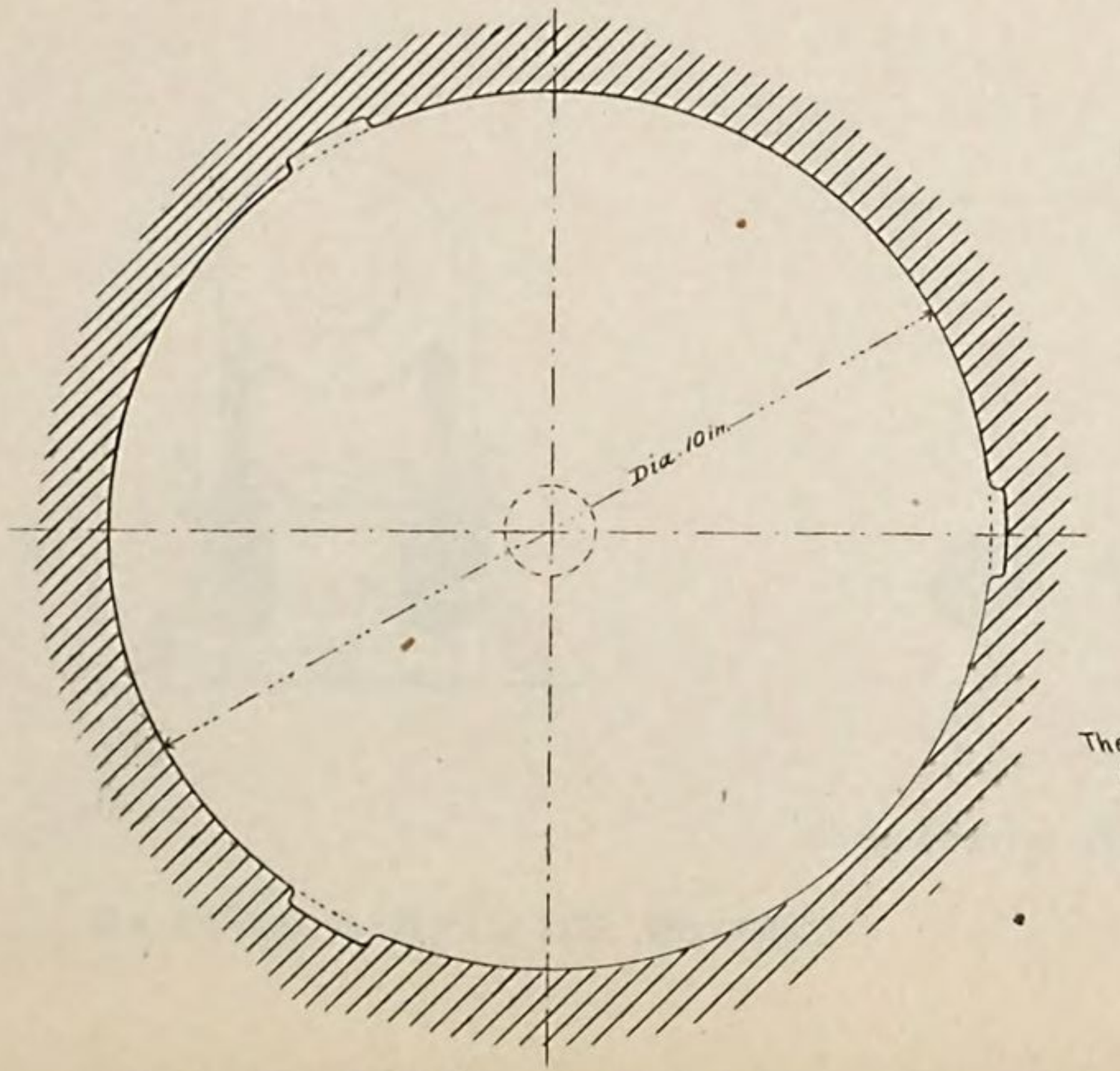
SEN. EX. DOC. No. 178 pt 2, 1st SESS., 47th CONG.

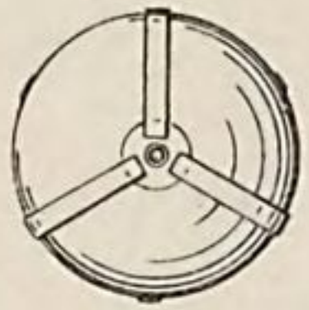
Combined Rifle and Smooth-Bore Gun of 10in Calibre with Three Grooves,
Adapted to the Bayonet Pointed "Spiral Triangular" shot.





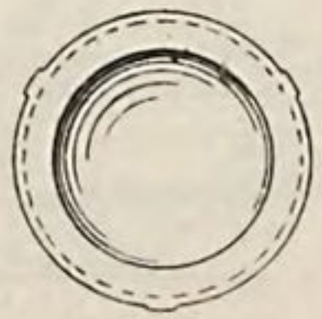




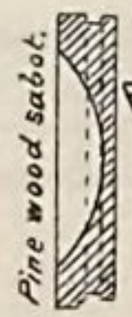




FIXED AMMUNITION OF SPHERICAL SHELL
with
IMPROVED SABOT
For Combined Rifle & S.B. Gun of 10in Calibre with Three Grooves.

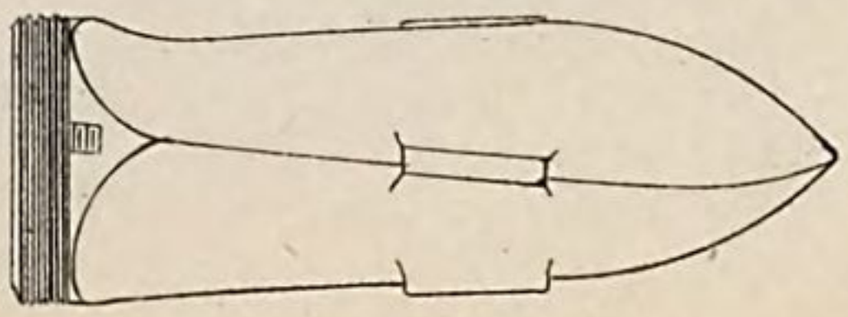


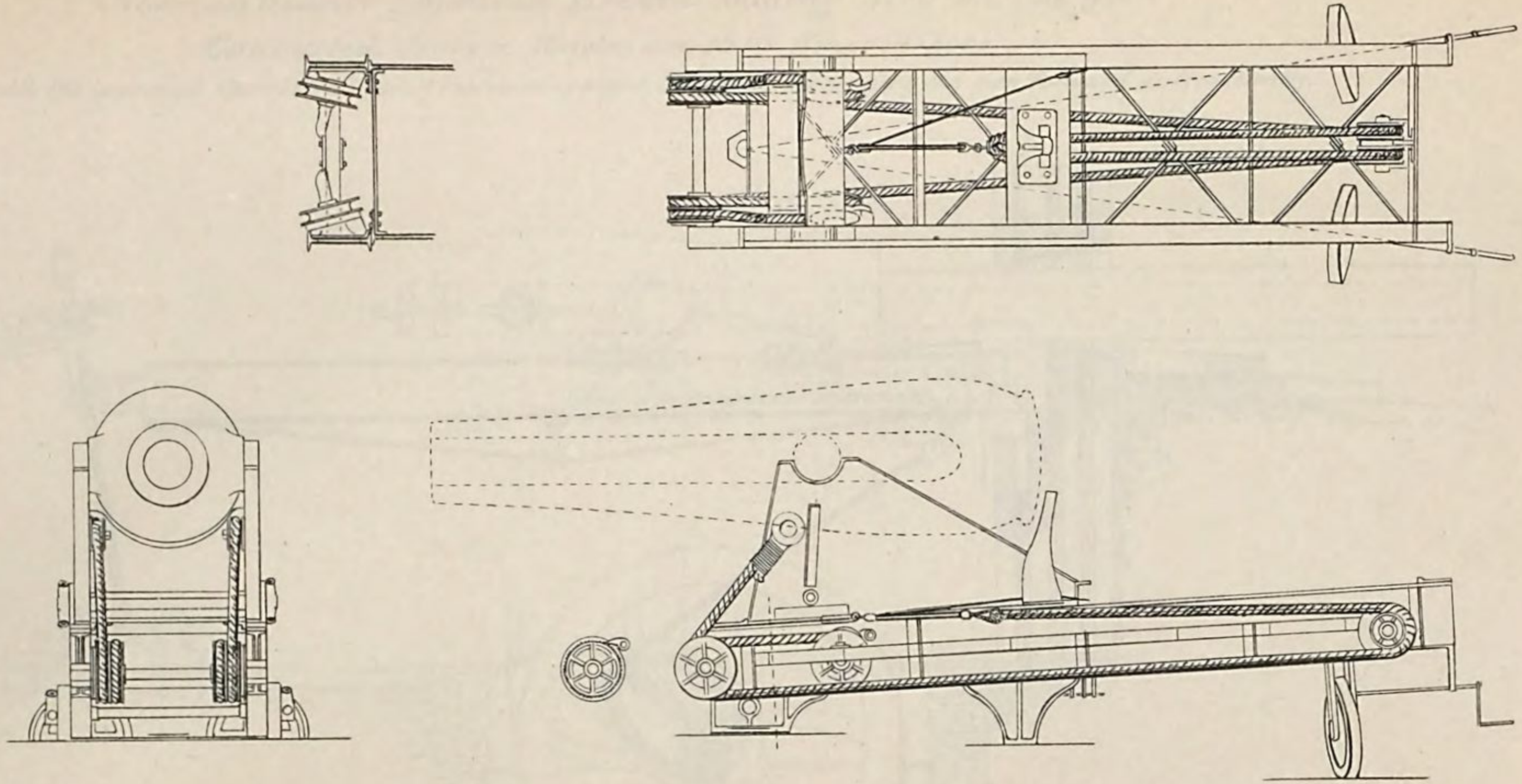
The projections on sabot to fit three grooves in Gun.



Bayonet Pointed "Spiral Triangular" Projectile, for Perforating Iron Defenses
Adapted to the Combined Rifle and S.B. Gun of 10in Calibre
and Three Grooves.







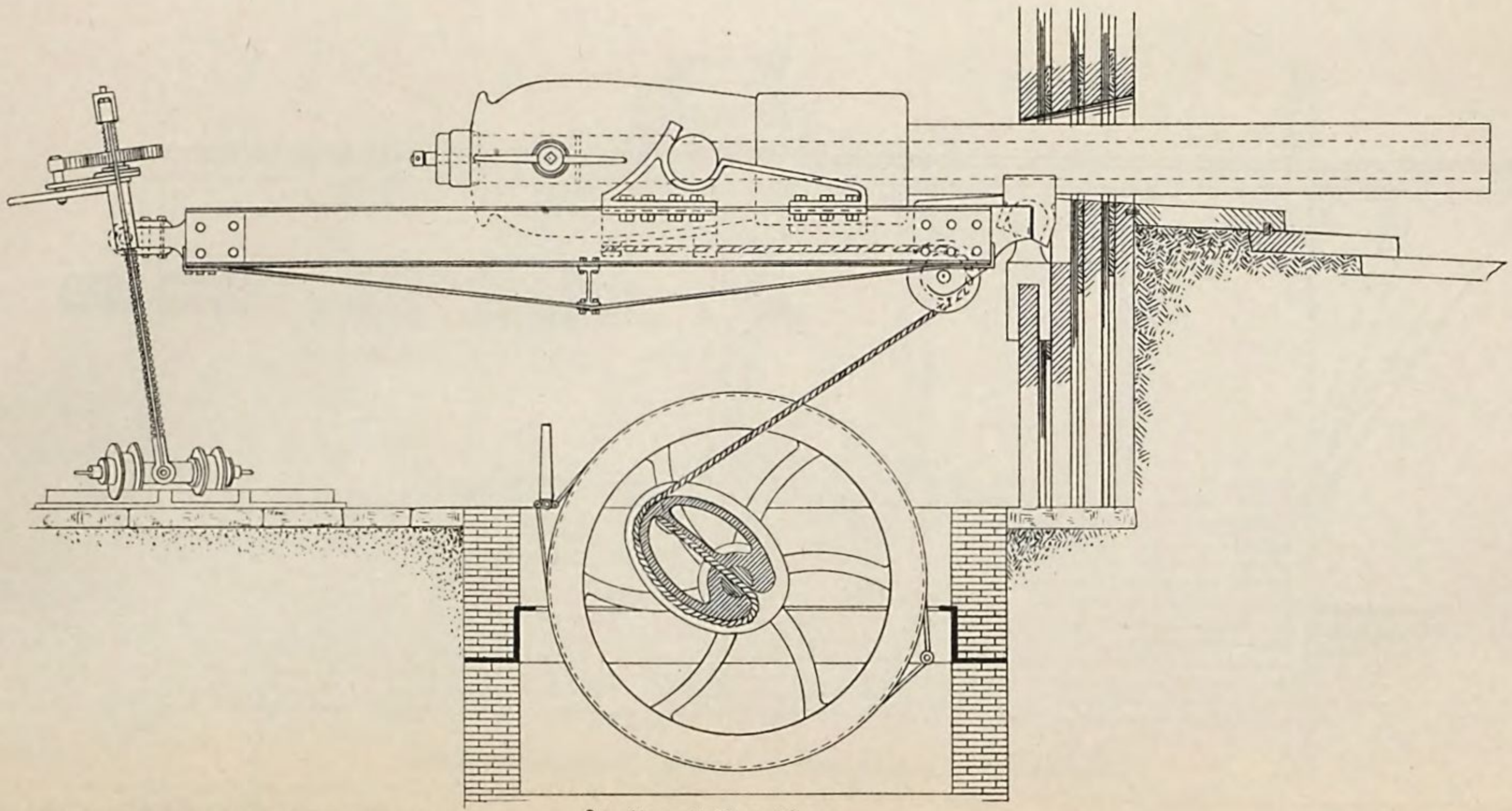
Snubbing Rope for Restraining Recoil.

SEN. EX. DOC. No. 178 pt. 2 1st SESS.. 47th CONG.

Norman Wiard's Improved Breech-loading 12 in Rifled gun

Converted from a Rodman 15 in Smooth-bore

with the improved Carriage, Recoil restraining ropes, and device for running the gun forward automatically.



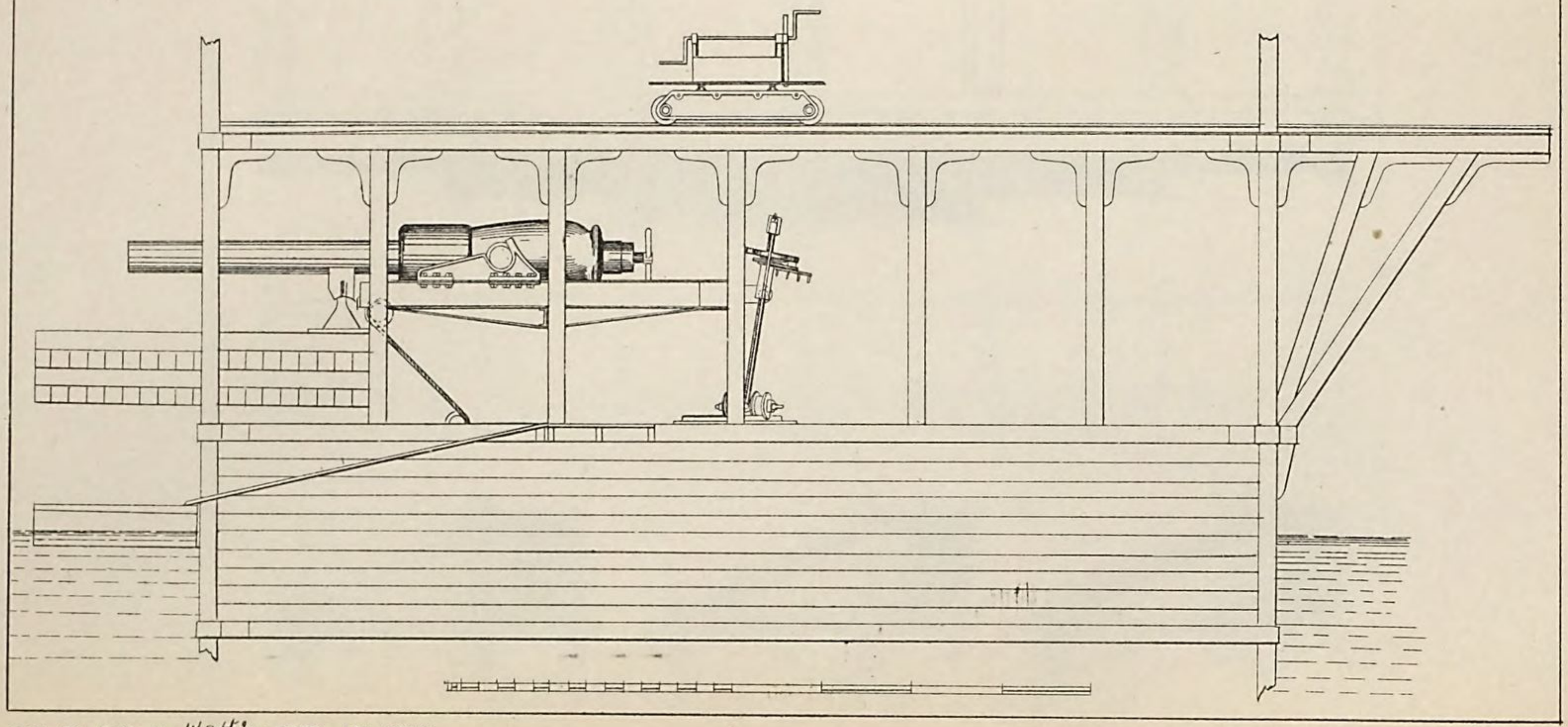
Sectional Elevation.

SEN. EX. DOC. No. 178 pt 3, 1st SESS., 47th CONG.

N° 1

F

Floating Battery for Norman Wiard's Ordnance Experiments
Near Washington D.C.

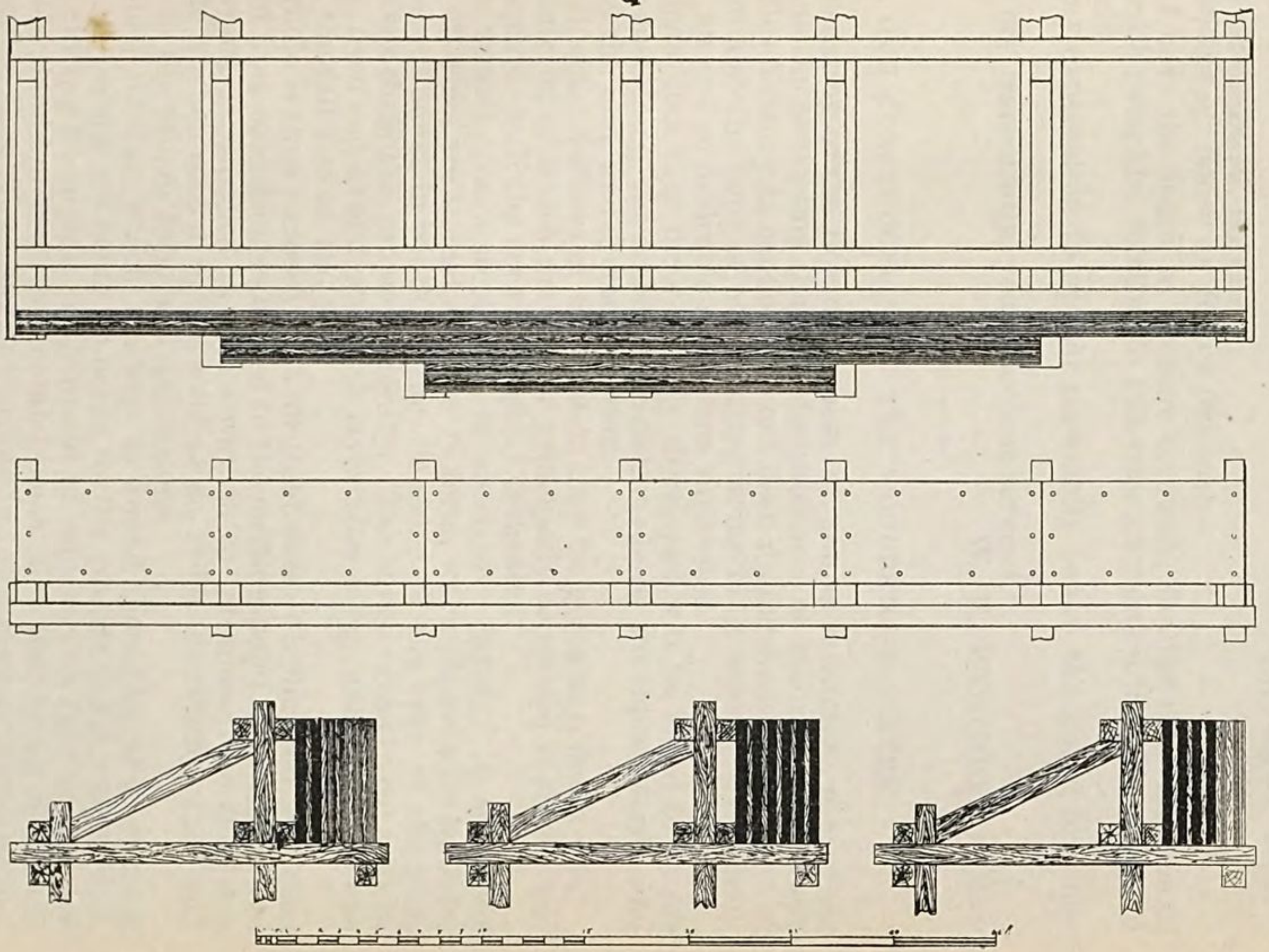


SEN. EX. DOC. No. 178 pt 2, 1st SESS., 47th CONG.

Iron targets for Norman Wards Ordnance Experiment,
for Washington DC. Weight 160,000.

Scale 1/4" = 1

G



SEN. EX. DOC. No. 178 pt 2 1st SESS.. 47th CONG.

W. E. WOODBRIDGE.

L. R., No. 118.] BOSTON, *July* 27, 1881.

General GEORGE W. GETTY,
President of Board on Heavy Ordnance:

SIR: I have the honor to present herewith, for the consideration of the Board, a pamphlet relating to gun construction on the plan patented by myself.

It is my expectation to appear personally before the Board in a few days.

Very respectfully, your obedient servant,

W. E. WOODBRIDGE.

GUN CONSTRUCTION ON THE WOODBRIDGE SYSTEM.

In presenting to the Board his plan of gun construction, the writer entertains the conviction that the desirableness of securing the utmost attainable efficiency in cannon has not been diminished by the lapse of time, and also the hope of contributing something toward the attainment of an end so desirable as the one suggested.

He trusts also that facts already developed will be found to go far towards sustaining the recommendation made by previous Boards who have had the plan under consideration.

The principal features of the system may be given in a few words.

The material of which the gun is principally composed is steel wire, drawn square, with the corners slightly truncated.

This is wound upon a steel tube, in successive layers. A sufficient number of wires are wound at once to form, when placed side by side, a band about equal in width to the diameter of the bore of the gun, which gives them the proper obliquity. The tube is closely covered in this way, from end to end, and with layer after layer, until the mass has reached the full size of the gun.

The whole is then inclosed in an air-tight case of boiler-iron, and, thus protected from oxidation, is heated to the melting-point of bronze, when liquid bronze is supplied in such a way as to interpenetrate the mass and unite it when cooled, in one solid piece, to be afterward turned and finished to the proper form and dimensions.

The steel tube on which the wire is wound should be at least thick enough to permit its being re-bored to the proper caliber and rifled, without cutting through it (as it would be undesirable that the surface of the bore should present two metals), some allowance being also made for a possible slight swagging or warping in the process of construction. It may sometimes be desirable to employ a thicker tube—the only objection in any instance being the substitution of the inferior metal of the tube for the stronger material surrounding it. Its length must exceed the finished length of the gun. Each end is provided with a flange, screwed on—the flanges being serviceable for fastening the ends of the wires, and for security in handling after winding. It should be closed at the breech end.

For the purpose of winding, the tube is rotated in a lathe or winding-
[illegible] the wires being drawn between friction-plates which are

carried, as the winding advances, with a regulated motion, in a line parallel with the tube.

In heating for the brazing process, the closed end of the tube (or breech end of the gun) is placed downward.

The trunnions of the gun may consist of bronze employed in the process of soldering, spaces for receiving the metal being provided within the case protecting the wire from oxidation.

The heating-chamber, in which the case with the wound wire inclosed is placed before the application of heat, is no larger than is requisite to afford sufficient space around the case for the draught from the furnace to convey the heat with proper freedom; an inch on all sides being enough for a very large gun. The flue bringing the heat from the furnace enters the chamber at the top, above the protecting-case. The flue by which the gases leave the chamber has its beginning at the bottom, but is carried up near the side of the chamber as high as the level of the entering flue. The walls of the heating-chamber and flues are necessarily composed of refractory materials. They must also be inclosed in an iron casing of such strength as to enable them to sustain the pressure of the metal which the chamber is destined to receive.

For the purpose of ascertaining the progress of heating, and when the proper temperature shall have been attained, pieces of bronze are suspended within the gun tube, in small perforated hollow iron cylinders, near the bottom and at different distances above it, by means of rods extending through the top of the tube, and, with proper protection, above the top of the heating-chamber. These rods are attached to short levers and nearly counterbalanced by attached weights. The sinking of the weights indicates the melting and escape of the bronze, and the attainment of the desired heat in that part of the mass in which it may be situated.

The fluid bronze for uniting the wires, though poured into the heating-chamber, is admitted only through the bottom of the case protecting the wire. The opening for this purpose is provided with a short tube projecting downward into a shallow iron cup secured in place. This tube is plugged with bronze until, in the progress of heating, the plug is melted from its place, when, being received by the cup, a liquid valve or trap is formed, preventing access of air to the interior of the case, but ready to admit the melted bronze when poured.

Pouring the metal cuts off the draught from the fire by closing the flue leading from the chamber. As it is desirable that the upper part of the gun should be last to cool, provision is made for re-establishing the draught through the upper part of the heating-chamber.

The advantages of a proper distribution of initial strains are procured by cooling from the interior, in the manner practiced by the late General Rodman, employing a current of air for that purpose.

The first embodiment of this mode of construction was brought to the notice of the Ordnance Department in the year 1850. (See report of the Chief of Ordnance, 1872, p. 159.)

A bronze gun having one-third the lineal dimensions of the six-pounder of the model of 1841 was made of standard gun-metal. Another small gun of the same interior dimensions and length was made of flat iron wire (the cross-section being $\frac{1}{4}$ by $\frac{1}{8}$ inch) wound upon an iron tube and soldered with bronze essentially in the manner described. The weight of the latter gun was slightly less than three-fourths that of the bronze gun, and the metal was so disposed as to give a proportionate thickness in the different parts of the gun. In the first firing, before boring or turning, and with a view to making a rough test of its strength, as well as to expanding the bore for the purpose of bri nging

out the resistance of the metal to an extent likely to obviate further enlargement under ordinary strains, the gun was set upright and loaded with fine-grained powder, occupying about one-third of the length of the bore, a wad, and a charge of small leaden shot filling it to the muzzle.

After completion, the gun was fired continuously for several days, with leaden balls fitting the bore and charges of one eighth of a pound of musket or rifle powder.

But the experiment relied on as a demonstration of its superior strength was a comparison of the resistance of the two guns to hydrostatic interior pressure. In each a plunger, packed at the end, was inserted a little beyond the trunnions, to the same distance from the bottom of the bore, and retained there. Water was forced in at the vent. The bronze gun was ruptured at an indicated pressure of a little more than 32,000 pounds per square inch. The soundness of its metal was manifested by its complete impermeability to water up to the point of rupture.

The wire gun withstood the same pressure without visible change.

In 1862 a small steel-wire gun was made at the navy-yard, Washington, D. C., by permission of the late Admiral Dahlgren, then in charge of the ordnance department at that place. The bore was 2.5 inches in diameter measured on the lands, or 2.7 inches measured in the grooves, and its exterior diameter 5.4 inches, making its thickness over the grooves just one-half the corresponding diameter of the bore. No lining-tube was used in its construction. The wire was wound on a mandrel of bronze of the same composition as the soldering metal, which commingled with it in the process of soldering, and filled the space within the wound wire. The lining of the bore was therefore of the same material with the solder.

The weight of the gun, exclusive of the trunnion-band, was 149 pounds.

The first test of this gun was made under the control of Admiral Dahlgren, with charges one pound of powder and a 4-pound projectile having an expanding metallic sabot. The inventor suggested the use of a heavier projectile, but was overruled by the admiral.

This test was carried only to the 105th round. A tangential specimen cut from the muzzle of the gun and submitted to test, indicated a tensile strength of more than 108,000 pounds per square inch.

The gun was subsequently sent to the late Edwin Stevens, esq., of Hoboken, at his request, for further trial, the manner and extent being left to his discretion without limitation from the inventor.

The extent of the trial by Mr. Stevens has not been learned by the writer; but upon his application for the removal of the gun for the test afterward made at Springfield, Mr. Stevens informed him by letter that he was "satisfied that it could not be burst by any charge of powder and projectile that could be put into it."

In 1865, by direction of the late General Dyer, then Chief of Ordnance, it was submitted to further test at the Springfield armory, under command of Colonel Laidley. It was there mounted on a six-pounder carriage strengthened for its work, and fired 1,327 additional rounds, the charge of powder being constantly one pound, and the projectiles either 7.81 or 10.22 pounds in weight—790 rounds of the former, and 537 of the latter.

Colonel Laidley's report may be found in the report of the Chief of Ordnance for 1872. The following is the concluding portion:

> The greatest enlargement of the bore, in the rear of the seat of the shot, caused by the 1,327 rounds of excessive charges, is only seven-thousandths of an inch, and there are, as yet, no indications of the gun giving away in any part.

It was intended to carry the trials further but for the breaking of the trunnion-band; it is, however, believed that the object of the experiment to test the strength and endurance of the gun has been already fully attained, and the strength and endurance of the gun abundantly demonstrated.

In March, 1870, a Board convened at the Ordnance Office, consisting of the following officers—General J. G. Barnard, General John E. Smith, General P. V. Hagner, General Thos. J. Rodman, General C. H. Morgan, Col. Thomas G. Baylor, and Col. J. C. Audenried, and having the subject of gun construction under consideration, made the following recommendation:

The Board is of opinion, from the results already obtained with a gun of small caliber made on Dr. Woodbridge's plan, that further trials of this mode of fabrication should be made with a gun of large caliber; and does, therefore, recommend that a 12-inch rifled gun be procured for experiment on such terms as the Ordnance Department may deem advisable.

This recommendation was approved by the Chief of Ordnance and the Secretary of War.

The subject is thus mentioned in the Report of General Dyer, Chief of Ordnance, for the succeeding year:

The principal nations of Europe, fully aware of the necessity of having heavy rifle guns for their coast defense, have spent millions in their experiments in search of a reliable rifle gun for coast defense. We have confined our experiments to one or two cast-iron rifles. The results obtained will not warrant me in recommending that any cast-iron rifle guns be procured for arming the forts. We must try some other material for heavy rifle guns. A plan submitted by Dr. Woodbridge, of New York, by which the gun is made of bronze and iron or steel wire, impressed me so favorably that I had a small gun which had been made by the Navy Department tested, and its strength and endurance were so great that I submitted the result to a board of officers, who recommended that a 12-inch rifle should be made on the plan and tested.

The recommendation received the approval of the Secretary of War, who authorized the experiment, and the gun was ordered. The act of July 12, 1870, which took effect a few days before the order was given, stopped the experiment by withdrawing the money which was necessary from the control of the War Department.

I have estimated for the funds for making the experiment, and I earnestly hope that it will be authorized by Congress. It ought to be done without delay.

Under an act of Congress, approved June 6, 1872, appropriating a sum for gun construction, and requiring the selection of at least three systems, breech and muzzle loading, a Board consisting of the following officers was appointed:

General R. H. K. Whiteley, president; General George W. Getty, General H. G. Wright, Col. T. T. S. Laidley, General T. Seymour, Col. S. Crispin, and Lieut. C. E. Dutton.

They conclude their report as follows:

From the above [forty inventions and proposals] the Board has selected the following models, including breech and muzzle loading cannon, for tests and experiments under the act of June 6, 1872, and in accordance with the resolutions embodied in the proceedings:

MUZZLE-LOADING GUNS.

1. Dr. W. E. Woodbridge's; 2. Alonzo Hitchcock's; 3. Cast-iron guns lined with wrought-iron or steel tubes.

BREECH-LOADING GUNS.

1. Friedrich Krupp's; 2. E. A. Sutcliffe's; 3. Nathan Thompson's; 4. French and Swedish system.

MISCELLANEOUS.

H. F. Mann's; Lyman's multicharge.

Should the appropriation under the act of June 6, 1872, not prove sufficient to include all the models selected by the Board, it recommends that the appropriation be spent upon them in the order in which they are named.

The following officers of the Ordnance Department constituted a Board "to recommend the place, manner, and details of the construction of the heavy guns selected by the Board instituted under the act of June 6, 1872," viz: T. T. S. Laidley, lieutenant-colonel of ordnance, president; J. G. Benton, major of ordnance; S. Crispin, major of ordnance, brevet colonel, U. S. A.; and S. C. Lyford, captain of ordnance.

The following extract is made from their proceedings:

The following resolution was then unanimously adopted, viz:

Resolved, That the Board recommends that the gun to be constructed on the Woodbridge plan, as recommended by the Board on Heavy Ordnance, organized under the act of June 6, 1872, for experiments and tests, be of 12 inches caliber without preponderence; and that the other dimensions be as fixed in the appended drawing, marked V; that a Woodbridge gun of 9 inches caliber be made prior to the 12-inch gun, in form and dimensions as shown in the appended drawing (marked VI); that both guns be constructed at Frankford Arsenal; that all other details of construction (understanding that the steel tube to be used be not less than 1 inch nor more than 2 inches in thickness) and selection and tests of materials be intrusted to Dr. Woodbridge, who shall receive such compensation for his services and expenses as may be agreed upon between the Chief of Ordnance and himself; that the commanding officer of Frankford Arsenal furnish all material, labor, and other necessary facilities for the prosecution of the work, under authority of the Chief of Ordnance, and keep a record which shall furnish a complete history of the details of the construction of these guns.

Under the recommendations above recited, and the approval of the Chief of Ordnance and Secretary of War, a gun was fabricated at Frankford Arsenal.

A substantial plant, including winding-machine and furnaces, for the construction of guns up to the size of 12-inch (or greater) caliber was first erected, the building formerly intended as a rolling-mill furnishing an excellent location for the purpose. Steel lining-tubes, protecting-cases, and accessories for both the 9-inch and the 12-inch gun were procured.

It becoming evident in the course of the work that the portion of the appropriation devoted to it would not be sufficient and available for the completion of both guns, at the inventor's request the conversion of the material intended for a 9-inch gun into one of 10-inch caliber was authorized. This change involved no change in operation until the gun reached the lathe. It led, however, to the retention of some portions of the metal at the ends, where the change in the obliquity of the wires was made, and which the originally proposed model rejected. The form given to the model of the 10-inch gun was influenced in part by the desirableness of retaining as much of the weight of the material as practicable (for at best the 10-inch gun would weigh but about seventy-five times as much as its projectile) and by the necessity of working from the already determined position of the trunnions as a center of gravity.

It being neither possible nor desirable to secure uniformity in the quality of the steel for the wire to be employed, the selection was made on the following principles:

A certain standard of extensibility, represented in torsional specimens of the wire (0.3 inch square) by a torsion of 0.7 of a whole turn in a length of one inch, was fixed upon for the inner portion of the gun, in view of its being of course desirable that the bore of the gun should be capable of expansion without bursting. It was found, as the result of tests, that this degree of extensibility could be secured in connection with a resistance equal to the torsional strain of 50 pounds applied at the distance of one foot from the center of motion; it being understood that the tests are applied after complete annealing.

This combination presents the maximum of extensibility required and the minimum of strength permitted.

With a relaxation of the demand for extensibility greater resistance may be had.

Taking any given enlargement of the bore, the extension of the metal is less, in any circle surrounding it, in a proportion depending on its relative diameter.

Therefore a metal combining less extensibility with increased strength is more suitable for the outer portions of the gun.

The requirements of the contract for the steel were accordingly based on a graded scale, in which the combination of qualities permissible began with that in which 0.7 of a turn was the representative of extensibility and 50 pounds the representative of strength; and ended with a torsion of 0.6 of a turn in combination with 60 pounds (or more) of torsional strength.

It was also required that the torsional yielding under a strain of 15 pounds should not exceed 0.01 of a turn—to exclude some steel of exceptional character.

A specimen of each wire (requiring about three inches of length) was taken for torsional test. After acceptance of the wire, the classification for winding was based on extensibility only.

The writer regrets that he cannot refer to the reports of Captain Prince respecting this gun, contained in the Report of the Chief of Ordnance, 1876, as furnishing a complete and accurate account of the process of construction—such as might have been expected from his well-known talent. To failing health and impaired mental powers the deficiencies may perhaps be attributed.

It is not necessary, however, to follow fully the details of the several operations involved in the completion of the work. They proceeded on the method already sketched, with the application (and omission, in part, it must be said) of various precautions devised to guard against obstacles to their success.

To these omissions we must soon recur.

The winding of the wire was accomplished at an average rate of a little more than 1,200 pounds per day of eight hours. Twenty-nine wires were wound at once, side by side, forming a band about 9 inches wide—under tension sufficient to secure close contact. The friction-plates between which the wire was drawn were so contrived as to distribute pressure on the wires individually; and a heavy hydrocarbon oil was used as a lubricant where the wires passed between them.

The protecting-case, in which the mass of wound wire and the tube it enveloped were inclosed, was about five-sixteenths of an inch thick. It would soon have been burned through if exposed to an oxidizing atmosphere. Two precautions against this action were resorted to. First, the case was coated with a mixture of finely-ground glass, silica, and fire-clay, made into a kind of paint with a solution of silicate of soda, and applied with a brush. Under the action of heat this coating became an adhesive enamel, not fusible at any temperature to which it was, or was likely to be, exposed. The second consisted in maintaining such a composition of the furnace-gases as should give them a non-oxidizing quality.

The heating-chamber, in which the mass of wire with its protecting-case was inclosed, and which became the receptacle of the soldering metal, was lined with coarsely ground fire-brick mixed with unburned fire-clay. That porosity (in its grosser sense) would be an undesirable quality of this lining was fully recognized in advance. For reasons that will soon be manifest this subject must be considered in some detail.

Fluid bronze does not enter the minute pores of compact burned fire.

clay (as does water at ordinary temperatures, or a fluent glass at very high ones), but, there being no capillary action, it enters only when pressed into spaces between such masses.

The theory of the proper constitution of the lining was based on the following considerations. Well-burned fire-clay (the material of fire-brick) will shrink no further at the temperature required in the heating-chamber. Could a lining be made of burned clay only, the particles resting against each other, there would be no shrinkage of the lining. The extreme possible infiltration of metal into such a lining would be the amount which would fill the spaces between these particles. Let this space be determined, and an amount of unburned clay, in plastic condition, sufficient to fill the interstices be supplied (the particles of brick being in contact) the only vacuity for metal would be that occasioned by the contraction of the unburned clay.

Estimated in this way, the infiltration would be very trivial.

To determine the requisite proportion of unburned fire-clay, the following experiment was made. A quantity of the ground fire-brick to be used in the lining was wetted, and thoroughly drained in an atmosphere saturated with aqueous vapor. An iron box of known capacity was filled with brick in this condition, closely packed. To this water was carefully added, to fill the interstitial spaces. The relative volumes of the wetted brick and of the water added were determined and made the basis of the proportions of the mixture, though some excess of unburned clay was added.

This mixture should have been worked intimately together, with water enough to give it a soft consistence, and allowed to dry again until its consistence would barely permit its being closely compacted by ramming. This was not done. The unbaked clay, in the form of a coarse powder like the ground fire-brick, was thoroughly intermingled with the latter in a dry condition, and moistened for use like molding-sand. The writer might possibly extenuate the error—it was contrary to his intentions—but he cannot escape responsibility for it—nor did it at the time impress him with its real gravity.

The relative positions of the heating-chamber and its contents, and the direction of the currents of heat, are shown in Plate VI of Captain Prince's report, before referred to, a copy of which is appended. (Plate II.)*

The fuel preferred for the operation of heating was anthracite coal, coked to expel sulphur. From motives of economy, however, bituminous coke was procured from Pittsburgh. It was well recommended, but afforded a large proportion of fusible and agglutinating ash, and was unfit for the use intended. Its use was discontinued as soon as charcoal could be procured.

The desirableness of maintaining a non-oxidizing quality in the furnace gases has been already mentioned. To test the composition of the gases with reference to that condition and the proper management of the heating furnace, an apparatus was constructed by means of which gas could at any time be drawn from the flue entering the heating chamber and tested in a few moments as to the proportion of carbonic acid contained, the presence of free oxygen, or of carbonic oxide.

The normal process of heating (which seems not to have been apprehended by the author of the report referred to) consists of two stages. In the first, the heat is slowly applied until the whole contents of the

* The whole process of construction is handsomely illustrated by the accurate model of the plant now in the museum of the Ordnance Department.

protecting-case are brought to a temperature of about 600° F. without any part being red-hot. In the second, the heat is raised with all prudent celerity to the melting point of bronze.

The reasons for slow heating in the early stage should perhaps be explained.

First, the lubricant, being wholly volatile at a temperature of about 500° F., leaves no deposit on the surfaces to which it may have been applied, resulting from evaporation. But if its vapor comes in contact with a surface heated to its decomposing point, say 800° F., carbon is deposited on the heated surface. Such a deposit on the wires impairs the completeness of the brazing. With the whole mass heated to the degree which would secure the conversion of all adhering oil into vapor (which would principally be expelled from the case), before any part of the wire had reached the decomposing temperature, this injury could not occur; with over-rapid heating of the upper portion of the wires while the lower portion continues to give off vapor, it is inevitable.

The second reason for slow and gradual heating in the outset is that it favors the equal distribution of heat in the draught passages, considered as flues, moderating the conflict between the descending and ascending portions, and rendering the control of the operation more easy by the establishment of natural draught, and rendering the auxiliary fire, requisite in the beginning, unnecessary.

The actual course of the heating was not normal. With the utmost good-will on the part of every one who had a share in the management of the furnace, the writer found, on his return from needed rest, that rapid progress seemed to have been understood as success, and that the upper parts of the heating-chamber and protecting-case were injuriously hot. How best to retreat from this disaster, with the least injury, was a more difficult problem than one will imagine who does not bear in mind all the conditions to be maintained. Of the method of returning to the normal operation of heating our present purpose requires nothing more to be said than that it was reasonably successful. The subsequent progress was normal to the end, the heating having lasted through seven days.

The melting-furnace, devised with special reference to securing the fusion of the metal without oxidation (a consideration of special importance in the process before us), and to rapidity of action, performed its part well.

The two abnormal parts of the work—the defective use of the lining material for the heating-chamber, and the too rapid heating of the gun in the first stage—have been dwelt upon because the first had, and the second may have had, an important part in producing results which we shall need to consider.

On pouring the soldering metal, though a large surplus had been provided, a deficiency was found, most unexpected to all present. The metal at first rose to the top of the gun-case, but began at once to sink. A large quantity of tin was added to supply the deficiency, as space was found for it—the additions continuing about eighteen hours. During this time the heating-furnace was kept in operation—the draught crossing the top of the protecting-case. The quality of the gases was no longer attended to, and a hole was burned through the case during the night. It had not received the slightest injury while it had an office to perform.

The gun was cooled from the interior by a blast of air carried to the bottom of the tube, assisted after about twelve hours by a spray of water injected into the current of air and carried with it. By the after-

noon of the third day the temperature was reduced below 212° F., and the further cooling was done with water.

On removing the casing of the heating-chamber it was found that the surplus bronze and the tin had been expended in penetrating the pores of the lining; the bronze infiltration occupying a space of from five to eight inches around the gun-case, and surrounding the sprue or mass of metal occupying what had been the ascending flue, and the tin filling spaces more remote.

The mass of bronze-conglomerate was very difficult to deal with; but by the persistent use of wedges and sledges it was finally removed.

On turning the gun down to its dimensions, the brazing was found apparently perfect to a point 4 feet and 6 inches in front of the center of the trunnions. From this point forward the wires were soldered with a metal principally composed of tin. This forward portion was reduced below the size required by the model and covered with iron bands shrunken on. A heavy steel band screwed on the tube completed the muzzle and secured the iron bands. The whole was afterwards finished to the proportions of the model.

These additions, it is hardly necessary to say, were for appearance, not for strength. Their position may be seen by reference to Plate I.

The gun has, up to this time, been fired ten rounds. The powder employed was Dupont's hexagonal; the projectile, the (so-called) Butler shot. The charges and indicated pressures per square inch, in the several rounds, were as follows:

Rounds.	Powder.	Shot.	Pressure.
	Pounds.	*Pounds.*	*Pounds.*
First	40	343	25,000
Second	40	343	25,000
Third	50	346	29,000
Fourth	50	346	33,000
Fifth	60	345	39,000
Sixth	60	371	37,500
Seventh	60	373	41,500
Eighth	70	370.5	29,500
Ninth	70	397	27,000
Tenth	70	397	29,000

No provision for further firing had been made.

After the eighth round, separations of the outside wires were discovered, from two to eight inches in length. This led to an examination of the bore of the gun, which showed no enlargement or injury.

The number and extent of the separations or openings of the wires increased in the next two rounds. They were all found nearly in the same transverse plane, about 19 inches in the rear of the center of the trunnions.

After the ten rounds had been fired, it was found that *the bore had contracted where the strain had been greatest.* So remarkable a result led to repeated measurements with the star-gauge in the hands of the expert who had constructed it. The measurements as reported to the Ordnance Department are given in an accompanying plate. The differences are small, but instructive. A ring of the united metal, 1.5 inches square, was cut from the spare material of the gun, about 3 feet in front of the trunnions, where the original diameter was about 31 inches. The ring was very nearly 29 inches in diameter. On cutting it across, it opened 0.02 inch, spontaneously, showing that even in this part of the gun the contractility was slightly greater in the outer than in the inner portions of the ring removed. No relative measurements of its

diameters before and after it was undercut and detached from the gun were made, so that the extent of its contraction while entire, and its initial tension, must remain unknown.

Several tests were made of portions of this ring, with the design of ascertaining the tangential strength of the material, and the cohesion of the bronze at the surfaces of union as against a force acting perpendicularly to such surfaces. The former test can be made in a tolerably satisfactory manner without difficulty. An average strength of 91,288 pounds per square inch was found. The second kind of test has not been so easy. The only three tests made under conditions at all favorable for obtaining correct results have been the tests reported by Capt. J. G. Butler, May 8, 1876, and two since, made at the Washington navy-yard. They give for the cohesion of the bronze, respectively, 34,886, 29,635, and 41,730 pounds per square inch; or an average of 35,750.

No experiment has been made giving directly the detrusive resistance of the brazing; but such as have a bearing on the subject cast no discredit on the conclusion drawn from the known properties of metals, that it is probably not less than would be expressed by the figures above given.

The metal of the tube was not found to be impaired, even in that part longest exposed to heat and considerably overheated.

Before estimating the extent of the effects resulting to the gun from the two mistakes interfering with the normal process of construction, it may be well to consider the results actually obtained.

The dominant questions in gun construction are those relative to resistance or strength.

The strains on rifled guns may be resolved into three kinds: the strain tending to rupture the gun laterally, in opposition to its tangential resistance; the longitudinal strain, tending to rupture it transversely; and the torsional strain induced by imparting a rotary motion to the projectile. This latter, however, may be resolved into components of longitudinal and detrusive strain, but is relatively so small as to be practically unimportant.

The strain of greatest severity is clearly the tangential. As an inference from the high tensile strength of the material, the great resistance in the wire-gun might be expected. The small number of rounds it has been fired might, in ordinary cases, present no striking evidence of strength. But the contraction of the bore, when subjected to indicated pressures of 39,000 and 41,000 pounds per square inch, indicates an excess of the contractile strain of the exterior portions (due to interior cooling) sufficient not only to meet the internal pressure, but at the same time to get the advantage of its interior antagonist, which had lost since the bore was brought to its full diameter the support of metal which was present at the time of the compromise.

To some the possibility of contraction under firing appears incredible. For the benefit of such, and for its neat explanation, the following extract from Major Maitland's paper on the "80-ton gun" (Proceedings of the Royal Artillery Institution, Woolwich, 1876) is quoted, as given in "Ordnance Notes," p. 369:

* * * It often happens on firing a new gun that the shock of discharge permits the atoms of the material to shake themselves, as it were, and settle down more comfortably.

This sometimes results in the shrinkage of the outer coils taking increased effect on the steel tube, but more usually the steel tube fits its exterior better to the interior of the coils, or perhaps slightly compresses their nearest particles, so that a slight expansion ensues.

* * * The [80-ton] gun, after firing twenty-one rounds, exhibited, as shown by

the table, a slight contraction in front of 225″ from the muzzle [62″ from the bottom of the bore], and a slight enlargement in the rear of this point, both being so small that the bore may be said to be practically unaltered; and thus the outer coils retain undiminished their power of promptly taking up the strain imposed upon the tube.

The 10-inch wire-gun yet stands alone, however, so far as known to the writer, in showing contraction in the region of the greatest strain after firing full charges.

The transverse strength of the gun was not, however, so fully demonstrated. This could not possibly have been expected. But the separations of the wire (or cracks, if we please to call them so) seem at first to tell against it. In the opinion of the writer they are more probably exemplifications of an adjustment of strains (not normal), resembling in some respects the phenomena above stated.

The strains acting in a longitudinal direction may be considered as divisible into three quantities: First, that corresponding to the pressure acting to propel the projectile and the powder-gases following it; second, that required to overcome the friction of the projectile; and, third, the longitudinal component of the force required for the rotation of the projectile already mentioned.

The second and third (with a projectile at all well constructed) are proportionally very small, and may ordinarily be neglected. The first, by which the gun is retracted as the projectile goes forward, is very considerable in magnitude, and is greatest in the plane of that transverse section which passes through the bottom of the bore. Since each portion of the mass of the gun resists the movement of recoil in a degree proportionate to its magnitude, it follows that the aggregate strain in the plane of the bottom of the bore will bear the same relation to the whole pressure on that surface that the mass of that portion of the gun forward of the plane mentioned does to the mass of the portion behind it; and that the strains at different transverse sections forward of the bottom of the bore will be proportionate to the masses lying forward of the several sections. This statement supposes the gun to be free, neglecting the resistance of the carriage.

In the case we are examining, the gun was mounted on a light temporary carriage. After making ample allowance for the effect of its resistance by virtue of both its inertia and friction, the strain on the cross-section of the gun at the bottom of the bore is found to exceed that at the locality of the separations of the wire by more than 25 per cent. This, if the separations were due to a defect in the system, should have determined their location.

The resistance of the tube alone would equal a static pressure of 53,500 pounds per square inch of the cross-section of the bore; and the combined resistance to transverse rupture offered by the tube, the longitudinal element of the resistance of the wire, and the cohesion of the bronze, as estimated on the basis of tests of the material taken from the gun, would equal a pressure of 394,000 pounds per square inch on the bottom of the bore—a pressure impossible from gunpowder.

If it were desirable to do so, the obliquity of the wires might be increased, it is evident, so as to give, without aid from the bronze, a transverse strength equal to its tangential.

As a practical test of transverse strength dependent on the system, the trial of the small gun at Springfield was one of peculiar severity. The brazed wire had no support from a lining-tube, and the cross-section of its metal, compared with that of the United States 3-inch wrought-iron rifle, fired with the same weight of projectile, is but as 1 to 3.8. It was fired from a six-pounder carriage of old and heavy pattern, heavily

reinforced with iron to give it the necessary strength; the whole weight (probably not less than 1,200 pounds) practically, as relates to strain in recoil, being added to the gun at the trunnions.

Recurring to the "cracks" or separations of wire: The fact that in the process of interior cooling the tube and interior portions of the gun contract in length as well as in diameter, will readily be recognized. As each of the outer layers closes upon those within, it will be strained not only in a tangential direction, but also in the direction of the length of the gun. This is not only unobjectionable, when occurring under normal circumstances, but favorable to bringing the resistance of the whole metal into action in opposing longitudinal strain. But in this instance we have the contraction of the outer layers of the gun resisted, not only on their inner side, but by their adherence to the "conglomerate" surrounding them, on the outer side also; and that by a material having a much lower rate of contraction than the metal itself, and rendered, by the support of the infiltrated material, incapable of being crushed by the contraction of the metal. It is perhaps more remarkable that these outer portions did not suffer absolute rupture than that their adhesion was impaired. Accepting the conditions just stated, and especially if we add what there is reason to suspect, that the union was also impaired by deposit of carbon, there is little reason to wonder that when the gun "shook itself," the constrained inner portion took the opportunity to make itself "more comfortable" at the expense of its infirm neighbor, which we may suppose, however, to have experienced some relief. According to this view, the interior portion of the gun, instead of having met an extending force it was incapable of resisting, may never yet have felt complete relief from outside constraint in the opposite direction.

The necessity of providing against the adherence of the soldering metal to the walls of the heating-chamber, and the importance of carrying out the original intent as to the prevention of infiltration have however been rendered apparent. The subject has received much attention since the gun was made, and expedients are not wanting to obviate the difficulty.

The most interesting bearing of the subject of the detrusive resistance of the bronze in the surfaces of union, is found in its relation to breech-loading.

The French system of "fermeture" (or American, if named in accordance with its origin), consisting of a slotted screw-plug fitted to a threaded and slotted cavity in the breech, appears to have an advantage over the "wedge fermeture" in one important respect: it permits the metal in the rear of the bottom of the bore to support, in its whole circumference, that portion of the walls of the gun which receives the greatest strain. On other grounds it is well adapted to use in connection with the system of construction which has been here described.

The lining tube, unless unnecessarily thick, would but little exceed the plug in diameter, and would not by its own strength, independent of the surrounding metal, afford sufficient resistance. We are therefore brought to consider the detrusive strength of its connection with the adjacent metal. Let us suppose that part of the tube which supports the plug to be equal in length to the diameter of the bore of the gun, and its thickness to be one-eighth of that diameter. We should then have an area of union between the exterior of the portion of the tube just designated and the surrounding metal equal to five times the area of the bottom of the bore. We have therefore a resistance, from this source alone, capable of withstanding a pressure per square inch equal to five times the detrusive resistance for the same area. We may put this last at the very

low figure of 30,000 pounds per square inch, and we shall be able with it to oppose a pressure of 150,000 pounds per square inch on the bottom of the bore.

In estimating the value of any system of gun-construction, it is of course essential that the qualities which constitute the highest excellence should be borne in mind.

The function of heavy guns is to deliver with precision and due frequency the heaviest possible blows, and upon occasion, at the greatest possible distances. They should be safe and durable, capable of being worked with few men, and of obtaining the best effect from a given quantity of ammunition.

Strength of material is subservient to every one of these requirements, and essential to the most important.

However cumbersome the mass of an inferior material, it can never be made to sustain the internal pressures by which alone large masses can be projected with the highest velocities.

Steel is the strongest of materials, and wire the strongest form of steel.

The preference of wire over steel in its massive forms is not limited to the differences which are apparent in ordinary tests. The fact has been repeatedly shown that the resistance of a very large specimen is not the product of its relative area of section multiplied into the tensile strength of a small specimen taken from the same mass. The explanation of this is easily found. The blow of a hammer not covering the mass on which it operates compresses the metal where the blow is delivered, and extends the environing material. There is at once a conflict of strains, which can be only partially corrected by the utmost skill in directing and graduating succeeding blows with the intent that one shall remedy the disturbance produced by the other. The quality of the metal may be improved, and well conducted annealing does much toward the relief of such strains, but never obliterates them. Wire-drawing seems to be the most perfect method of bringing each portion of the material to the support of each other portion.

The process of brazing induces no unfavorable change in the material. Cooling under tension does effect a change, analogous to slight tempering, and increases its tensile strength with slight diminution of extensibility. But if the material is properly selected, the change is beneficial.

A fact which should not be overlooked, is, that whatever the extent of the advantage derived from interior cooling and initial strains in an inferior material, a proportionate advantage is found in the superior, where the same principles are applicable.

The production of guns that should be able to withstand the highest pressure that gunpowder can exert, would, without doubt, be a consummation greatly to be desired. Perhaps it should not hastily be pronounced unattainable.

A few words as to the relative cost and facility of construction of guns under this system. Steel wire, the principal constituent, costs much less than the rough forgings from which a "built-up" steel gun is made, and the cost of the latter, considered as material only, is greatly enhanced by the loss of weight in reducing these masses to their finished dimensions. The winding of the 10-inch gun, as already stated, was accomplished at an average rate of more than 1,200 pounds per day of eight hours. Probably this rate might be doubled by practice. It is evidently not a costly operation. Very little bronze enters into the com-

position of the gun itself. Under normal circumstances, but a small part of that employed would be lost.

The cost of the necessary plant is relatively small.

In the present state of steel manufacture in this country, large masses of well-forged steel of home production are difficult to procure. This system is content with a lining-tube—which may, without any serious disadvantage, be composed of parts of one-third its whole length.

As to the number of guns which may be produced in a given time (a consideration sometimes more important than pecuniary economy) the system has a great advantage over "built-up" guns, in the simplicity of the work of finishing, and the absence of a series of surfaces to be successively turned or bored with delicate and time-consuming accuracy.

In the specification of his patent on the construction of ordnance the inventor uses the following words:

> I also propose, in some instances, to use wire wound under constant tension, and united with a solder of low fusibility, so that the elastic tension of the wire may not be impaired in the process.

In applying this method of operation to guns, the central tube should have sufficient strength to meet the longitudinal strain. Though not, in the opinion of the inventor, the *most desirable* mode of construction for very large guns, he believes it deserving of comparison with the systems of "building up" now in use.

For an 8-inch gun, a tube of ordinary steel, 13 inches in diameter, would receive the "screw fermeture" safely, and when brought, by the addition of wire wound under strong tension and soldered at a temperature that would not impair its elasticity, to the diameter of 24 inches (or a thickness of one caliber) over the parts requiring the greatest resistance, the structure would possess great strength.

W. E. WOODBRIDGE.

L. R., No. 235.] NEW YORK, *January* 27, 1882.

To the BOARD ON HEAVY ORDNANCE,
General George W. Getty, President:

GENTLEMEN: Since my first communication to the Board respecting my method of constructing guns of steel wire, you have been pleased to subject the gun made at Frankford Arsenal on that system to extreme proof, and to order that it should be cut up for inspection and tests, which work is now in progress.

The most trustworthy results thus far apparent are the confirmation of the indications of great tangential strength, and the discovery of the principal cause of the relatively deficient resistance to longitudinal strains in that part of the gun in which openings early manifested themselves on the first trial, namely, that *insufficiency of heat had led to imperfect brazing.*

This passing tribute may, however, I believe, be paid to the gun, that "with all its imperfections on its head," no other gun in this country, since the days when such (fabulous) pressures as 240,000 pounds per square inch were occasionally read, *has* sustained (whatever might have been) nearly an equal number of rounds, giving pressures of equal severity.

It may be noted, too, that not even the final pressure of 74,400 pounds per square inch developed any sign of yielding to longitudinal strain in the plane of the bottom of the bore, where the stress exceeded by more than twenty-five per cent. that at the plane of defective union and rupture.

At the time of my first communication the causes of the defect mentioned were, in some respects, in doubt. The part attributed to the adhesion of the exterior of the brazed mass to the infiltrated walls of the heating-chamber in resisting the longitudinal contraction of the exterior portions of the gun, and in supplementing, perhaps to an injurious extent, the *normal* resistance of the first-cooled interior portions, seems to have been justly assigned to it; but there appears to be no longer "cause to suspect that the union was also impaired by a deposit of carbon." The sole additional cause was, doubtless, that now apparent, insufficient heat.

It may seem strange that with the facts before us relating to the incomplete fusion of the test-pieces, and the occurrence of unsoldered wires in proximity to the base of the finished gun at the time of its fabrication, did not lead at once to the recognition of the true cause of the defect. A thorough analysis of those facts might have led to that result. But a natural conclusion was that where the heat was most deficient, there would be found the defective brazing, a conclusion true under some circumstances, and actually exemplified in the defective brazing discovered just below the position of the base of the gun.

A full consideration of the subject requires that the following facts should be adverted to:

The components of bronze, copper and tin, unite with avidity at a temperature which will render both fluid. Even at a heat somewhat lower than that required to melt copper, that metal may be dissolved in tin, and forms with it an alloy of the same kind as that produced by the previous fusion of both. But in cooling toward solidification every such alloy shows a tendency to separate into alloys in which the component metals are found in different proportions, in a manner analogous to the separation of mixtures of alcohol and water, or saline solutions in freezing, in which the crystals first formed consist most largely of water, and the last congealed are most alcoholic or saline.

At the commencement of the solidification of bronze, crystals are separated consisting of an alloy containing a larger proportion of copper than any of the later-formed crystals; and the process of crystallization continues with the declining temperature (which need not, however, extend through any considerable range), separating the originally homogeneous fluid mass into many alloys, varying in their proportions of copper in the order of their solidification, and, also, in greater or less degree, in color and mechanical properties.

Every bronze casting consists of an agglomeration of such crystals filled in (though probably never *perfectly* filled) with the metal of last congelation. When the masses in which crystallization occurs are large and the rate of cooling is slow, the structure just mentioned is often very apparent in the casting. The separation is also made apparent in remelting bronze castings under conditions which permit the metal first fused to flow out from the remainder. It percolates the mass of fine, needle-like crystals formed in cooling, and among which it was diffused, and drips away. This is exemplified in the condition of the lowermost of the "test-pieces" mentioned (which have been exhibited to the Board), and is often observed in the remelting of guns in a reverberatory furnace, where the more fusible portions are seen dripping away before the guns have lost their form.

In employing any metal as a solder it is requisite that the surface with which the solder is desired to unite should be hot enough to receive the metal in its fluid state; in other words, it must have the temperature of the fluid soldering metal.

This requirement constitutes the necessity that the mass of wire to be united in the plan of construction under consideration should be heated to the melting point of the bronze employed for its union. If the whole of the bronze so employed were obtained by "liquation" (or the dripping process before mentioned) from a mass of bronze of the composition of the metal actually employed, it would only be necessary, for securing a union, to raise the temperature of the wire to the fusing point of that alloy. If the supply of the liquated bronze were but partial, and only a part of the mass to be soldered were heated to the melting point of the first congealing portions, while a part of it had only the temperature of the liquated metal, the question of complete union would depend, it will readily be seen, upon the relative proportions of the mass of wire at the lower temperature (or more strictly speaking, upon the interstitial spaces in it) and the supply of liquated bronze.

In the circumstances of the case before us we had the following conditions: The wire was heated to the temperature at which the whole of the bronze would remain fluid from the top of the mass to a point somewhat lower than the trunnions of the future gun. Somewhere between that point and the location of the lower "test-piece," of which the fusion is incomplete, the heat fell below that point. We may well suppose it to have been the location of the faulty brazing. From thence to the bottom (with the exception of a small portion near the base of the finished gun and close to the tube) the temperature was still sufficient to maintain the fusion of liquated bronze. The supply of bronze for soldering entered from the bottom. Its temperature was higher than required for mere fusion, and of course it imparted a portion of its surplus heat to whatever it came in contact with that was cooler than itself. But the quantity entering the gun-case was relatively small, and its influence upon the temperature of the mass to be soldered superficial.

In considering the distribution of the bronze, let us first suppose the mass to be wholly heated to the normal temperature. On the entrance of the fluid bronze it rises on the sides of the mass of wire higher than among the wires, to an extent depending upon the rapidity of the supply. But it enters freely among them, filling first at the bottom, where the capillary action, everywhere strong, is supplemented by the greater pressure, and, rising gradually through the mass, fills it to the top.

Taking now the conditions actually present, let us see what must occur. As the metal rises around the lower part of the mass, it enters the interstitial spaces freely in the superficial portions which we suppose to have been fully heated by the assistance of the soldering metal. In the attempt to penetrate further, it receives its first chill, which here, as elsewhere, results in the crystallization of a portion of the mass. These crystals, though minute, find themselves in spaces too narrow to permit them to go further. But past them flows the unsolidified portion. If the metal enters cooler spaces, more crystals are separated, but, if the supply is sufficient, the flow goes on unless spaces are reached where not even liquated metal can retain its fluidity. Such a spot seems to have been found only in one small locality in the mass—that already referred to. We may suppose the flow into the lower part of the gun (that was to be) to go on rather slowly, for it must to some extent be impeded by the imprisoned crystals, and the wires can be filled only so far as the supply of liquated metal suffices. If the deficiency of temperature were infinitesimal, the small quantity of metal on the same level might be supposed to yield a sufficient supply. Under the actual circumstances, this seems not to have been the case. The rising metal must

have reached the normally-heated portion of the mass, which it doubtless quickly penetrated, before wires lower down had found a supply. From the upper side, as well as laterally, the metal would seek to interpenetrate the insufficiently heated wires. The available supply of liquated metal would flow through those wires to the lower part of the vacant space, and the final deficiency would be found where we find it, at the upper portion of the mass deficient in heat.

We might expect, too, what we actually find, that a portion of the liquated metal would be detained by capillary action in the smaller spaces between the wires over which it flowed in its descent.

Fortunately, the already apparent remedy of the evil is far simpler than the explanation of the method of its occurrence. It is simply the application of more heat.

The means of determining the temperature (briefly described in a former communication) were perfectly correct in principle, but faulty in application. The error was this: The counterpoises of the test-pieces were not, as they should have been, placed on the levers where they would have indicated the *complete* fusion of the metal. The adjustment should (in other words) have been made with the perforated tubes for containing the test-pieces, *empty*.

An adjustment to other conditions might also have been made, but *this* should have been considered essential. With it there could have been no doubt as to the complete fusion of the tests.

W. E. WOODBRIDGE.

L. R., No. 278.] WASHINGTON, *March* 29, 1882.

GENERAL S. V. BENÉT,
Chief of Ordnance:

SIR: I respectfully submit the accompanying papers and drawings relating to the construction of heavy ordnance and projectiles, comprising the following structures:

A cast-iron 10-inch gun of 25 calibers length, banded with cold-hammered or cold-rolled bands of steel, and designed to fire a 400-pound projectile with 80 pounds of powder.

A cast-iron 10-inch gun of 25 calibers, reinforced with hard-drawn square steel wire, wound under high tension, and united with a solder of low fusibility. Designed to fire a 400-pound projectile with a charge of 100 pounds of powder.

A 12-inch steel gun of 30 calibers length, having a lining tube overlaid with longitudinal bars or "staves" of cold-hammered or cold-rolled steel to receive the greater part of the longitudinal strain, and which are covered with bands of cold-hammered or cold-rolled steel, placed on under tension for giving the requisite tangential resistance. Designed for firing a projectile of 800 pounds weight with 400 pounds of powder.

A 12-inch steel gun of 30 calibers length, having a lining-tube overlaid with bars or "staves" of cold-hammered or cold-rolled steel, which are wound with hard-drawn square steel wire under high tension and united with a solder of low fusibility. Designed for firing a projectile weighing 800 pounds with a charge of 400 pounds of powder.

A brazed steel wire gun of 12-inch caliber, and 30 calibers in length. Designed to fire an 800-pound projectile with 400 pounds of powder.

An 18-inch brazed steel wire gun of 30 calibers length, reinforced with hard-drawn steel wire wound under high tension, and united with a

solder of low fusibility. Projectiles of cold-hammered steel, with expanding sabots.

I have honor to be, very respectfully, your odedient servant,

W. E. WOODBRIDGE.

[First indorsement.]

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, April 29, 1882.

Respectfully referred to the Board on Heavy Ordnance and Projectiles.

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

MODES OF CONSTRUCTING HEAVY ORDNANCE.

PROPOSED BY W. E. WOODBRIDGE.

The several systems of construction herewith submitted are not presented as being equally advantageous for guns of high power, but the endeavor has been to present the best development of the different classes of construction which have yet a possible foothold in the estimation of constructors of ordnance.

If this can be done, it seems to be the way in which the comparative merits of different systems will best be made to appear. And if there are positions for guns of a second class, the study of the construction of such may not yet be out of place.

The pressures and velocities given in connection with the several models represented in the accompanying drawings are derived from the tabulated results of Messrs. Noble and Abel's experiments combined with the data afforded in the test of the 10-inch wire gun at Sandy Hook in October last. The three rounds with 80 pounds of Du Pont's hexagonal powder I. O. B. No. 2, in which we have the density of loading, are taken as coming more nearly to the conditions of service with the new guns than anything else accessible, although the density of loading was very high, being 0.95.

The pressures were estimated upon the hypothesis that the observed pressure in the instance mentioned bears the same proportion to pressures exerted by the same quality of powder where the density of loading is different that the pressures of the products of complete combustion bear to each other with the same difference of densities. The hypothesis is not considered to be strictly correct, but is perhaps as nearly so as any that our present data will enable us to construct.

It was thought proper to take as a basis for the estimates a pressure somewhat higher than the highest recorded in the three rounds mentioned, as it is presumable that, had the firing been extended, higher pressures would have been indicated in the course of the ordinary variations in that respect, and the higher rather than the average pressures seem to be most important in this connection.

The coefficient of energy was derived from a comparison of the energy due to the observed velocity in the three rounds selected, with the calculated energy derived from Messrs. Noble & Abel's work.

1st. *Cast iron strengthened with bands of cold hammered or cold-rolled steel.* (See drawing No. 1.)

The essential difference between the structure here proposed and the banded cast-iron guns which have been brought into use, consists in the employment of rings of steel which have been extended in diameter and changed in mechanical properties by cold-hammering or cold-rolling before being fitted to the gun.

By this treatment the elastic limit of strain is carried higher than by tempering, while the remaining extensibility is very much more considerable, and the bands may safely be applied under greater tension.

The rule for the tension of strengthening-bands is (supposing the tension to be equal in all parts of their circumferences), that when the tube to which the band is applied shall be enlarged by internal pressure to the limit of its extensibility without rupture, the band shall be extended to the limit of the elasticity of its material. That this rule is not of easy application, with our present knowledge of metals and their variable qualities, is readily admitted. But a band of this description, having much remaining extensibility after passing its elastic limit, will, under moderate overstrains, be able to assume a new and higher limit of elasticity, at the expense of its further extensibility, which may yet remain sufficient for the demand to be made upon it. It will therefore be prudent to approach more nearly the best ascertained limits of initial strain in the application of the band than in the use of those which do not combine, in so great a degree, resistance and extensibility.

In a series of tests recently made at the Washington navy-yard, at my suggestion and under my supervision, the following results were obtained in the treatment of a specimen of steel in a manner analogous to that proposed for the bands. The steel employed had, when thoroughly annealed, an elastic limit of strain equal to 40,774 pounds per square inch, and a tensile strength of 71,530 pounds, with an extensibility in a length of 2 inches, and diameter of 0.5 inch, of 30 per cent. After cold-hammering under blows acting upon only one pair of surfaces its elastic limit of strain became 78,940 pounds, its tensile strength 86,580 pounds, with an extension of 14 per cent.

The best mode of applying such bands is undoubtedly by forcing them to their places by pressure acting at right angles to their planes. The preference for this method over that of shrinking on, after the application of heat, arises from the more uniform distribution of strain in the different parts of their circumferences. From causes which need not here be particularized, the uniform cooling of a band contracting upon a mass of cold metal, is at least a matter of difficulty and uncertainty; and the part last to cool is subjected to the greatest strain, because the great friction of the band resists the equalization which would occur in its absence. In the mode first mentioned no such disturbing cause arises; and were the strains from any cause to be unequally distributed, the process itself would tend to restore uniformity, upon the principle that the tendency of every movement is in the direction of the resultant of the impelling forces. The contractility of the band, if not uniformly strained, would lend its assistance in bringing points in its circumference too widely separated under excess of local strain to their proper distances.

But the application of bands by the preferred method requires special and somewhat costly apparatus, which fact, together perhaps with a misapprehension of the advantages of the method, has led to the general adoption of "shrinking on" in its place. The great advantage of extensibility, beyond a high elastic limit, to meet the uncertainties of the process, is evident.

The choice between the two suggested modes of preparing the bands,

cold-hammering and cold-rolling, may perhaps be decided in favor of rolling, if questions of present convenience are left out of consideration, but it would be necessary to construct a plant to carry it into effect, and at very considerable cost.

There are several hammers in the country which could do the work well, with an inconsiderable outlay for special appliances.

The bands should be hammered on a heavy mandrel passed through them and supported on each side. Each blow should cover the width of the band operated on, and the blows should succeed each other at short intervals of space while the ring is carried round under the hammer.

The efficiency of the support rendered by bands applied to guns depends wholly upon circumstances not apparent upon mere inspection, and it is not surprising that differences of opinion, derived from ordinary observation, have prevailed upon the subject.

The amount of support afforded by a band is proportionate to its contractile force at the moment of the highest strain upon the gun, irrespective of its diameter.*

It may be worth while to see how much this force will amount to in several different cases. Let us first suppose the band to be of the same material and the same in all its qualities as the tube to which it is closely fitted, but without tension. It would be expanded by pressure within the tube precisely as if it formed a part of it. Nothing would be gained or lost as respects resistance by its being a separate piece of metal. But (varying the case) if the metal of the band possessed twice the elastic resistance to extension that was first supposed, its contractile force under the same extension and its support to the tube would be doubled. On the other hand, if its elastic resistance were but half as great, its support would be but half as much. So, too (varying the case again), if a band of the material first supposed were capable of twice the elastic extension it would receive under strain in the first instance proposed, it would, *if applied with proper initial tension*, give twice the support to be derived from homogeneous metal. If the metal of a band had just twice the elastic resistance of the first with the same extensibility, and (like steel of high temper) its limit of elasticity and of extensibility were the same, its greatest efficiency would be secured when applied without initial tension.

Such a ring applied with tension, even though its tension were kept well within the limits of its strength, would render support varying from nearly its best to nothing at all, according to the degree of its tension when applied. It is to be borne in mind that the tube is compressed by the action of a band encircling it under tension, and rendered incapable of taking any part in resisting internal pressure until the force transmitted to the band has brought it relief by expanding the latter until its interior diameter is equal to that of the tube in its normal unstrained condition. Both the tube and the band must arrive at their limits of resistance at the same time in order that their combined resistances may be the sum of the capabilities of both. In the case last supposed the capability of the band is necessarily exhausted sooner than that of the tube, because it comes to rupture before the tube has reached its full expansion. If the band is applied with a tension very near its point of rupture a slight addition to the elastic expansive force

* This assertion is not at all in conflict with Professor Barlow's theory as announced by himself or as modified by the refinements of others. The only reason why the exterior portions of a homogeneous hollow cylinder give so little resistance to interior pressure is that they are so little brought into tension.

of the tube (which equals, of course, the contractile force of the band) by internal pressure, will extend it to rupture, and that long before the tube has been able to offer *any* resistance. The band begins to afford assistance only when the initial strain is lowered to the point which permits the tube to return to its original diameter before the rupture of the band.

The examples proposed will, it is thought, be suggestive of the importance of the combination of high elastic resistance with a reserve of extensibility in a material for banding guns, enabling it to adjust itself in a considerable degree without injury to strains that would otherwise be fatal.

For the principal particulars respecting the banded cast-iron gun reference is made to the accompanying table and drawing No. 1.

In assigning so nearly one caliber ($8\frac{3}{4}$ inches) as the thickness of the cast iron walls, not only resistance to longitudinal strains has been considered, but also the effect of banding under heavy tension upon the metal. The effect of exterior compression by strains acting circumferentially is not only to reduce the diameter of a tube, but also to extend its length, in a way in some degree analogous to the drawing of ordinary brass and copper tubing. Cast iron is not in any considerable degree a ductile metal, and should not be required to submit to much change of form. Further, at the conjunction of the banded with the uncompressed portions of the tube, strains occur which impair its resistance to longitudinal stress. But for the considerations mentioned, the thickness of the walls might be very much reduced.

The body of the gun is slightly tapered, enlarging from the rear, in that portion which receives the bands. An average thickness of somewhat less than 3 inches and width of 9 inches has been assigned to them. They are applied in but two layers.

Reference has been had to simplicity of structure, and the limits of dimensions for steel rings of the desired character within the range of convenient and successful manufacture.

The Chambers, or, as it is more commonly called, the French system of *fermeture*, has been adopted as the best now known. The accompanying drawing (Plate IX) represents the system as adapted to the 9-inch converted rifle by the United States Navy.

To the screw are given a somewhat greater diameter and length than would be requisite in steel, in concession to the qualities of cast iron.

No interior tube of steel is proposed for the gun, not because it is supposed that it would not be thereby improved, but because it is considered that the system in the presence of superior ones, where high qualities are requisite, should be confined to a simple and not too expensive development.

The trunnions are placed at the position of the center of gravity when the breech-screw is removed.

The same adjustment is adopted with respect to all the guns proposed.

2d. *Cast iron strengthened with wire of high tensile strength wound under tension and united with a solder of low fusibility.* (See drawing No. 2.)

The form and dimensions of the gun proposed under this system are nearly those given to the banded cast-iron gun, the principal difference being that the chamber is one inch larger in diameter, and lengthened enough to receive a charge of 100 pounds of powder with a density of loading of about 0.8. The diameter of the cast-iron body of the gun is retained, and it is parallel where it receives the wire. Although the

pressure of the wound wire will perhaps be greater than that of the bands, it is believed that it will be distributed with greater uniformity, and that for that reason the cast-iron portion of the gun will not be more severely taxed.

It is proposed to use hard-drawn wire 0.15 inch square (or a little larger), tinned before being wound. The wire may have a tensile strength of at least 150,000 pounds per square inch, and may be wound under a tension of 50,000 pounds or more to the same area, the tension being regulated by a self-adjusting apparatus.

For soldering, a temperature of only about 400° F. is required. The operation would be conveniently accomplished by the use of a bath of solder applied in an upright tank of boiler-iron just large enough to receive the gun, which, being temporarily closed at the breech, would be placed, muzzle upward, within it. The depth of the tank would need only to be sufficient to include the wound portion which is wholly in rear of the trunnions.

The band carrying the trunnions would be screwed and shrunken on after the soldering, its tension being moderate, and in consequence serving to ease the transition from the heavy strain of the wire upon the tube to the unconstrained condition of its forward portion. A lighter band forward of the trunnions will contribute to the same end.

3d. *A steel gun composed of a lining tube overlaid with longitudinal bars* (or "staves") *of cold-hammered steel and banded with cold-hammered rings of steel.* (See drawing No. 3.)

The lining tube may be of low steel, and thinner than usually employed. Its immediate envelope is a series of "staves" of cold-hammered or cold-rolled steel, which are intended to resist the longitudinal strain.

The best method of treating the metal of the "staves" at present available is, doubtless, by hammering in swages, cold, after annealing.

The results of this treatment in the tests made at the Washington navy-yard, before mentioned, upon the same steel as that used in the tests of which the results have been given were as follows:

A specimen, the diameter of which was reduced by swaging from 2.05 to 1.62 inches, had an elastic limit of 85,000 pounds per square inch, with a tensile strength of 95,049 pounds and an elongation of 9.85 per cent.

Another specimen, reduced in the same way from 2.05 inches diameter to a diameter of 1.52 inches, had an elastic limit of 101,800 pounds per square inch and a tensile strength of 111,790 pounds, with an elongation of 8 per cent.

The aggregate area of the cross-section of the "staves" exceeds that of the chamber by 50 per cent. Their length is about half that of the finished gun. Near their forward end and covering the position of the shot when the density of the products of powder combustion has become 0.5, is attached by screwing and shrinking a band which receives the strain in recoil and communicates it to the trunnions by means of a tube or jacket or series of bands interposed between them. This arrangement is considered preferable to a direct attachment to the cylinder of "staves" at the position of the trunnions, as permitting a better provision for the greater strain upon the gun at that place.

The bands which furnish the resistance to tangential strains are put on in three layers as far forward as the trunnion-band; thence, for a distance of some feet, in two, and forward of that to the muzzle in a single layer. The width and thickness of the bands are such as to come within the requirements imposed by the means of producing them of the proper quality.

The considerable number employed may be supposed to distribute the strain of their contractile tendency more justly than would a small number of heavy bands. They *ought to be* forced to their places by hydraulic or other direct pressure.

The tension with which they are applied should in each layer be near the elastic limit, for the material has sufficient extensibility beyond that point to make it quite safe to allow it to make its own adjustment.

4th. *A steel gun having a lining tube of steel overlaid with longitudinal bars of cold-hammered steel and wound with steel wire applied under high tension, subsequently united with solder of low fusibility.* (See drawing No. 4.)

The portions of the gun intended to meet longitudinal strains closely resemble the corresponding parts of the one last described.

Wire is substituted for the bands in a manner that will be apparent upon inspection of the drawing. Two or three wires may be wound at a time as a matter of economy. For soldering, the gun may be inclosed in a close-fitting case, resembling a boiler, and the operation conducted with the gun in a horizontal position. The union of the soldering metal affords a detrusive resistance of about 3,000 pounds per square inch of soldered surface (2,972 pounds in a recent experiment). A wire of the size proposed to be used (0.15-inch square) would be attached strongly enough, if soldered on all sides for a length of 2 inches, to withstand a strain of more than 150,000 pounds per square inch on the wire. It is unnecessary to provide any protection to the wound wires when thus united, and they may be turned with a light cut over the exterior, to give a finish.

The wire should have a high elastic limit of strain with a safe extensibility beyond that limit.

It is evident that in winding, the interior layers, if applied with the same tension as those succeeding them, will, as the process goes on, become more and more relieved of tensile strain (in consequence of the compression of the interior portions and reduction of their diameters) until, if the process is carried far enough, they will be wholly freed from it. A still further continuance of the process would, of course, effect compression in the direction of the length of the wires. This, it is presumed, would rarely occur in practice. But to whatever extent the effect mentioned may be produced, when the gun is subjected to internal pressures the exterior wires will *first* be brought to a tension greater than that at which they were wound. Inasmuch, however, as the rate of extension in the different layers is nearly in inverse proportion to the squares of their distances from their centers, the interior layers soon reach an extension by which their tension is brought to overtake or surpass that of the exterior.

In order, then, that the whole mass of wire should do its utmost in resistance, within the limit of its elasticity, the uniform strain on the wire in winding should be such that when the innermost layer has expanded so far as to bring the tension upon it to its elastic limit, the exterior layer will have reached the same limit also.

If the wire be wound under a tension equal to its limit of elasticity, and afterward subjected to an internal strain which will restore the innermost layer to that tension, each layer outside of it will have been extended beyond its *original* elastic limit, and have assumed a new one slightly higher. This may occur without any disadvantage if the extensibility of the wire is what may easily be given to it, in combination with a high elastic limit, reaching without doubt as far as 100,000 pounds per square inch.

The drawing of this gun represents the tube as being composed of two pieces, not because two are preferred to one, but to illustrate the fact that the system admits of the use of a divided tube if necessary.

5th. *A gun composed of a steel tube wrapped with steel wire and brazed.* (See Drawing No. 5.)

This system has been sufficiently described in previous communications to the Ordnance Department, and to the present Board on Heavy Ordnance and Projectiles, and exemplified in construction.

The 10-inch gun lately fired at Sandy Hook was made in accordance with a resolution of the Board of Ordnance officers convened in September, 1873, "to recommend the place, manner, and details of the construction of the heavy guns selected by the Board instituted under the act of June 6, 1872," recommending—

> That a preliminary gun of smaller caliber be made on Dr. Woodbridge's plans, for the purpose of giving the necessary experience to the workmen to construct the 12-inch gun determined upon.

The course of construction, proof, cutting up and tests of the material of the gun have furnished much of the instruction it was designed to afford.

The importance of a sufficient heat in the process of soldering has been emphasized, and the results of a deficiency made manifest in its various relations, while the sufficiency of the means of determining the heat, with proper adjustment, has also been shown.

Accepting, without remark in this place, the conclusions which have been drawn from the Watertown tests, we have a detrusive resistance in the attachment of the tube to the surrounding wire of 19,418 pounds per square inch. This is sufficient in *ten inches* of the length of the tube to resist the thrust of a pressure of 100,000 pounds per square inch within the bore.

The average strength of the specimens tested for longitudinal resistance, as given, is over 19,000 pounds per square inch. This, neglecting the resistance due to the oblique winding of the wires, and leaving out the aid of the tube, gives a resistance, calculated on the area of the cross-section of the gun, more than equal to the strain produced by an internal pressure of 200,000 pounds per square inch.

I have also thought best to submit a drawing (No. 6) presenting the manner in which the steel tube now at Frankford Arsenal could be used in the construction of a 10-inch gun. To procure a length of 25 calibers, it would be necessary to add a piece to the tube, as represented in the drawing. It can hardly be considered a satisfactory model for a gun of high power—the diameter of the tube restricting within too narrow limits the diameter of the chamber. If the question of endurance of strains merely were the object of construction, it might well meet that demand.

6th. A brazed steel-wire gun on the system last mentioned, with the addition of a reinforce of hard-drawn steel wire wound over the chamber.

The accompanying drawing (No. 7) and the sentence above will sufficiently indicate the proposed construction. It is based upon the idea that after providing in the foundation structure for the longitudinal strength required in common with the tangential resistance, the latter may be further increased by the addition of a material of still higher strength as related to that kind of resistance.

Though the pressure of gunpowder has its limits, it can hardly be doubted that in very large charges, such for instance as that proposed for the gun represented, 1,250 pounds, the local or wave pressures produced by the surging of the large mass of gases and fluid material gen-

erated must be more violent than in smaller guns and call for greater strength to control them.

This structure is proposed for guns of very large caliber.

COMPARISON OF SYSTEMS OF CONSTRUCTION.

In examining briefly the relative merits of the modes of construction here proposed, we may begin with the strengthened cast-iron guns.

Comparing either of them with guns of cast iron only, we find a resistance in addition to that of the cast-iron body equal to the whole contractile effort of the added bands or wire exerted at the time when the gun has reached its limit of expansion, and which, upon any just principles of estimation, will be found to have rendered the combined resistance considerably more than double that of the unaided cast iron, even under the supposition that the cast iron is of the best quality, and that the effect of interior cooling has been to produce the best possible arrangement of initial strains.

That but a small part of this added strength would be gained by increasing the diameter of the cast-iron gun to that of the bands or winding, will hardly be questioned.

In comparison with other banded guns (when the bands have been judiciously applied) the claim for superiority must rest on the superior merit of the material used for bands.

As the added strength in either case depends upon the contractile force of the bands or wrapped wire at the moment when the body shall have reached its limit of extension, a comparison of elastic limits of strength and extension, and, as an element in the availability of the qualities mentioned, of extensibility beyond the elastic limit, must decide.

Comparing the two systems of strengthened cast iron between themselves, the wound gun, it is believed, must have the preference, both in strength and facility of construction. The material may be even superior, and the mode of application will secure the most uniform possible distribution of pressure upon the surface of the body of the gun. This makes safe the application of greater compressive force, and consequently of higher tension and greater resistance in the envelop, permitting increased charges and the greater efficiency of the piece.

In considering the position on the scale of merit of the steel-tubed guns in which longitudinal cold-swaged bars or "staves" are used as the principal reliance for longitudinal strength, while bands or wires furnish the tangential resistance, it may be well first to compare them between themselves.

In a general way, the question between bands and wire must be decided as in the former case. But in that portion of the gun which is forward of the band from which connection between the "staves" and the trunnion-band is made, the bands may, especially in naval use, where it is expected that guns will be fought behind armor, but with their chases always protruding (and exposed in a greater degree than in land service to being struck with missiles of moderate but injurious size), have the advantage of being less liable to injury than wires soldered as proposed. Of course the systems may be combined in the way which suggests itself from what has just been said—the portions receiving the greatest strain being wire-wound, and the chase being banded, without any want of harmony.

Taking, then, the wire-wound gun as the better representative of the two allied systems we are considering, we may compare it, first, with

the strengthened cast-iron guns lately mentioned. The relatively deficient strength of the cast-iron guns must be apparent. The body or tube upon which the bands are shrunken or wires are wound is not of a material which will bear without injury the constricting (or compressing) force which may be applied upon a steel interior, and upon that force tangential resistance principally depends. As relates to cost, if the question be considered simply as to price per pound, or even as to guns of the same caliber, the cast-iron gun may have the preference. But this is not the rule of comparison. If a certain standard of energy within the capacity of the cast-iron guns be fixed (and other qualities, such as mobility, economic use of powder, &c., be neglected), we come nearer a basis for an estimate of relative values, and one which may in some cases be justly employed; but when the duty of a gun is placed beyond the point that the cast-iron guns can attain, there is no common ground upon which a comparison can be constructed. That which cannot do what must be done becomes valueless.

We turn now to the various "built-up" guns so well known in European practice. It is by no means intended to ignore the excellent work that has been accomplished. But the recent pushing toward the use of wire (to speak of nothing else) seems a confession of much yet to be desired. As structures of this class seem now to be in advance, we may confine our comparison to them. In these guns there are two "organs" (as they have been properly called) for resisting the expansive force of the fired gunpowder, one for controlling the longitudinal effort, and the other for resisting the lateral or tangential strain.

The same dual arrangement is found in the gun proposed. The interior tube takes some part in the resistance to both the strains mentioned, but the longitudinal effort of resistance is committed chiefly to the series of bars forming a tube of staves immediately surrounding the lining tube. By the treatment to which they are subjected, they acquire a resistance within the elastic limit of strain which is quite unknown in tubes of one piece. Each component bar or stave is susceptible of a reliable test before it enters into the structure, so that its size and the proper amount of work to be committed to it may be well determined. We have also in these swaged staves a resistance to the constricting or crushing force of the wound wire far greater than steel in an ordinary gun-tube is capable of offering. A tension that would greatly reduce the diameter of the latter, with longitudinal extension, would be borne by the staves without permanent change of condition.

As relates to the means of tangential resistance, the important feature consists in the union of the wires by a solder of low fusibility. The temperature at which this soldering is done does not impair in the least their elasticity or strength. As a means of perfect fastening alone it seems complete. A very few inches of soldering attach the wire with a strength equal to its tenacity without any impairment of that quality to fit it for bending or other change of form. Soldering also fixes it unchangeably in the position assigned to it in winding, avoiding the creeping tendency which must result from the irregularity of the strains brought upon the same continuous wires in the same layers in different parts of their lengths. The perfect filling of the spaces between wires in different layers (which, without soldering, are in contact only upon very small surfaces) must contribute to the permanent maintenance of the original strains, which would otherwise be in some degree lessened by the compression of the wire under the action of firing at the small surfaces of contact.

The soldering of the wires makes it ordinarily unnecessary to resort

to exterior bands for its protection. The solder itself excludes water and atmospheric influences. The cutting of a wire or two in unsoldered masses releases the whole of the continuous wire, while the injury which should divide a number of the soldered wires would be only local.

The gun of brazed steel wire presents greater simplicity of construction than either of the structures previously mentioned. A lining-tube and a covering of brazed wire constitutes the whole. It may be treated as being completely a unit, and its dimensions may everywhere be made to conform to the interior strains (if known), so that no superfluous metal shall remain, and the vent may be inserted at the most advantageous point. By the process of interior cooling the whole mass of wire may be brought into high tension quite within the limit of its extensibility.

The brazed-wire gun needs no duplication of "organs" to enable it to meet the longitudinal strain. This is asserted of a well-brazed gun; the qualifying words being suggested, and perhaps demanded, by the recent longitudinal parting of the 10-inch wire gun at Sandy Hook. The occurrence mentioned demonstrates that with the obliquity of winding employed in that gun, and with the imperfection (very great it must be called) existing in the brazing at the location of the separation, the longitudinal strength was insufficient. It seems also to be demonstrated that with quite imperfect brazing the longitudinal strength was sufficient to resist the high-pressure of 74,400 pounds to the square inch, in that part of the gun, too, in which the longitudinal strain is necessarily the greatest—that is, in the plane of the bottom of the bore.

It is now perfectly evident, too, that the cause of imperfect brazing was the want of a sufficiently high temperature in the lower portion of the mass of wire.

The application of the remedy is simple and has already been stated.

The fact that a gun was not perfectly brazed when insufficiently heated affords not the least presumption against its being perfectly brazed when sufficiently heated.

The endurance of longitudinal strain by the small wire gun tested at Springfield Armory in 1865 perhaps deserves mention here. Though the internal pressures were not taken, a valuable comparison may be deduced from the results. Of the 1,327 rounds there fired, 537 were with projectiles of 10.22 pounds weight each, the charge being one pound of small-grained powder. Taking the area of the section of the bore, including the grooves, to be 5.1 square inches, the mass of metal opposing the action of the gases by its inertia would be, with sufficient accuracy, 2 pounds to each square inch. The corresponding relation in the 10-inch gun with a 400-pound projectile is almost exactly 5 pounds to each square inch. We will make the supposition, for the present purpose, that the pressure of the powder will be increased in proportion to the weight of the projectile compared with a given area of pressure. We will also assume one caliber as not an unreasonable thickness for the gun. In the Springfield gun we had but half a caliber, the area of section in that case being as 3 to 8 in the gun of one caliber thickness.

It results, then, that upon the assumption that the small gun was strained to its utmost resistance (which is more than we have any reason to suppose), and that the pressures in the 10-inch gun were two-and-a-half times those in the smaller gun (a supposition probably erring on the side of excess), we still find the strength of the brazed gun in excess of the demand.

The brazed-wire gun has manifested a tangential resistance by contraction of the bore in the powder chamber and resistance to enlargement under heavy pressures without a parallel, so far as known.

Comparing the brazed-wire system with that in which the wires are united with a solder of low fusibility, in respect of strength, no very decided superiority appears on either side.

The greater tangential resistance for an equal area of section is decidedly with hard-drawn wire; and if *static* resistance only is to be considered, the system in which it is employed must probably be given the preference in respect to ultimate capability. The necessity of employing two elements or "organs" of resistance in the structure of a gun—meeting the longitudinal and tangential resistances separately—must, however, be considered undesirable.* Either system seems to be capable of giving all the resistance required in dealing with gunpowder.

In respect to cost and the time required for the fabrication of guns, after the establishment of the manufacture, the brazed-wire system must have the preference, though on the other hand the plant required for the gun united with solder of low fusibility would be less expensive.

The union of the brazed-wire system with the winding of hard-drawn wire, as illustrated in drawing No. 7, is believed to carry resistance to the action of internal explosive forces as far as is possible in the present state of the arts.

PROJECTILES. (See drawing No. 8.)

The principal peculiarity of the projectiles proposed in rifled guns consists in the treatment to which the material is subjected. For use in guns of high power, no other material than steel is considered to be really suitable, especially for use against armor.

It is important that projectiles for that purpose should have great resistance to deformation upon impact, for the reason that the work done in changing the form and molecular condition of the material on striking is, at best, so much deducted from the energy of the projectile, while the projectile itself is often so changed as to become unfitted for the service intended.

The kind of steel considered most suitable is one which, with normal constitution, would have a tensile strength, when annealed, of 100,000 pounds, or a little more. It should first be forged hot, as usual, and then annealed, after which it should be "upset" cold, by hammering or pressure.

Both solid projectiles and shells may be subjected to this process with

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*The supposition maintained by some that the two kinds of resistance exerted by a hollow cylinder—tangential and longitudinal—are antagonistic to each other, and that there is therefore an advantage in employing separate portions of a gun to meet them independently, cannot be considered to be well founded.

In the series of experiments already mentioned as having been recently made at my suggestion at the Washington navy-yard, is the following:

Two hollow cylinders from the same steel, thoroughly annealed at the same time, and, in all respects receiving, in every stage of their production, identical treatment, were subjected to longitudinal strain, one being empty and the other subjected to an interior strain of known relation to the tensile stress.

Each was 1″.000 in diameter exteriorly, and was bored to an interior diameter of 0″.750, giving a cross-section of 0.3436 square inch. The measuring-points for longitudinal extension were 5″.000 apart.

The specimen without interior pressure was permanently elongated by a strain of 12,000 pounds to the extent of 0″.050. The specimen with interior pressure was permanently elongated 0″.051 by a strain of 13,200 pounds.

With a strain of 15,000 pounds the specimen without interior pressure was permanently elongated 0″.106, while the specimen with interior pressure was elongated but 0″.086 by a strain of 15,600 pounds.

The specimen without interior pressure broke with a strain of 23,505 pounds. The specimen with interior pressure (which, at the time of breaking, amounted to 9,458 pounds per square inch), bore, before breaking, a strain of 25,091 pounds.

advantage. The rigidity of steel is so much increased by this treatment that hollow projectiles may safely be made much thinner, and therefore capable of receiving larger bursting charges; or, if shrapnel, a larger number of balls.

The means of giving rotation consist in the application to the projectile of an expanding sabot, represented in section in the accompanying drawing. Its action will be readily understood from inspection. It is forced by the pressure of the gases developed from the charge of the gun into the grooves and against the rear surface of the projectile, maintaining its hold upon each by precisely similar action. The enlargement of the ring at its rear serves to determine the position of the projectile in the gun, and to give, in the first moment of pressure, a gas-tight contact with the walls of the chamber at its junction with the rifled bore, which contact the valvular action of the sabot tends to maintain. Upon the perfection of this action freedom from "scoring" or "channeling" of the bore, of course, depends.

The similarity between this sabot and some others now in use and known by other names, makes it proper, he believes, that the writer should justify his claim to the invention by reference to facts to be found in the records of the Ordnance Department.

Reference is especially made to the record of firing with his rifled gun at Fort Monroe in the autumn of 1850. The library of the Department contains a copy of his pamphlet relating to projectiles with expanding sabots, printed in 1852, and which has been in the possession of the Department since that time.

The accompanying plate (No. X) is a photolithograph of a tracing of one of the plates in the pamphlet referred to, furnished to the writer by the Department at his request.

10-*inch cast-iron gun, banded, 25 calibers; bands cold-hammered.* (Plate I.)

Caliber	inches..	10
Weight of projectile	pounds..	400
Weight of powder charge	do...	80
Length of bore	calibers..	25
	inches..	250
Length of gun	inches..	270
Greatest diameter	do....	40
Weight of gun	pounds..	52,000
Maximum diameter of powder chamber	inches..	10.5
Length of powder chamber	do....	36
Capacity of chamber	cubic inches..	2,960
Density of loading		0.75
Maximum powder pressure (estimated)	pounds..	30,552
Muzzle velocity	feet per second..	1,520
Muzzle energy	foot-pounds..	14,850,310
Muzzle energy	foot-tons..	6,460.39
Penetration in iron (by Colonel Maitland's formula)	inches..	17.23
Estimated cost		$12,000
Outlay for special tools		500

10-*inch cast-iron gun, wire wound 25 calibers; wire soldered.* (Plate II.)

Caliber	inches..	10
Weight of projectile	pounds..	400
Weight of powder charge	do...	100
Length of bore	calibers..	25
	= inches..	250
Length of gun	inches..	270
Greatest diameter	do....	40
Weight of gun	pounds..	52,000
Maximum diameter of powder chamber	inches..	11.5
Length of powder chamber	do...	40
Capacity of chamber	cubic inches..	3,465

Density of loading		0.8
Maximum powder pressure (estimated)	pounds	34,578
Muzzle velocity	feet per second	1,652
Muzzle energy	foot-pounds	16,959,626
Muzzle energy	foot-tons	7,571.26
Penetration in iron (by Colonel Maitland's formula)	inches	20.36
Estimated cost		$8,500
Outlay for special tools		750

12-inch steel gun, longitudinal bars, banded, 30 calibers; bars and bands cold-hammered. (Plate III.)

Caliber	inches	12
Weight of projectile	pounds	800
Weight of powder charge	do	400
Length of bore	calibers	30
	=inches	360
Length of gun	inches	384
Greatest diameter	do	48
Weight of gun	pounds	107,000
Maximum diameter of powder chamber	inches	14.6
Length of powder chamber	do	80
Capacity of chamber	cubic inches	13,200
Density of loading		0.85
Maximum powder pressure (estimated)	pounds	39,105
Muzzle velocity	feet per second	2.073
Muzzle energy	foot-pounds	53,406,909
Muzzle energy	foot-tons	23,842.37
Penetration in iron (by Colonel Maitland's formula)	inches	44,54
Estimated cost		$45,000
Special tools or "plant"		2,000

12-inch steel gun, longitudinal bars, wire-wound, 30 calibers, wire-soldered. (Plate IV.)

Caliber	inches	12
Weight of projectile	pounds	800
Weight of powder charge	do	400
Length of bore	calibers	30
	=inches	360
Length of gun	inches	384
Greatest diameter	do	48
Weight of gun	pounds	108,000
Maximum diameter of powder chamber	inches	14.6
Length of powder chamber	do	80
Capacity of chamber	cubic inches	13,200
Density of loading		0.85
Maximum powder pressure (estimated)	pounds	39,105
Muzzle velocity	feet per second	2,073
Muzzle energy	foot-pounds	53,406,909
Muzzle energy	foot-tons	23,842.37
Penetration in iron (by Colonel Maitland's formula)	inches	44.54
Estimated cost		$33,000
Special "plant"		3,000

12-inch, brazed steel-wire gun, 30 calibers. (Plate V.)

Caliber	inches	12
Weight of projectile	pounds	800
Weight of powder charge	do	400
Length of bore	calibers	30
	=inches	360
Length of gun	inches	384
Greatest diameter	do	48
Weight of gun	pounds	105,000
Maximum diameter of powder chamber	inches	14.6
Length of powder chamber	do	80
Capacity of chamber	cubic inches	13,200
Density of loading		0.85
Maximum powder pressure (estimated)	pounds	39,105
Muzzle velocity	feet per second	2,073
Muzzle energy	foot-pounds	53,406,909

Muzzle energy	foot-tons..	23,842.37
Penetration in iron (by Colonel Maitland's formula)	inches..	44.54
Estimated cost		$37,500
Addition to "plant"		7,000

Proposed 10-*inch brazed gun, with Frankford Arsenal tube.* (Plate VI.)

Caliber	inches..	10
Weight of projectile	pounds..	400
Weight of powder charge	do....	150
Length of bore	calibers..	25
	=inches..	250
Length of gun	inches..	270
Greatest diameter	do....	40
Weight of gun	pounds..	48,500
Maximum diameter of powder chamber	inches..	11.1
Length of powder chamber	do....	52
Capacity of chamber	cubic inches..	4,891.6
Density of loading		0.85
Maximum powder pressure (estimated)	pounds..	39,105
Muzzle velocity	feet per second..	1,907
Muzzle energy	foot-pounds..	22,582,110
Muzzle energy	foot-tons..	10,082.29
Penetration in iron (by Colonel Maitland's formula)	inches..	27.12
Estimated cost (using tube at Frankford Arsenal)		$16,500
Estimated cost, employing longitudinal bars		18,500
Alteration of plant		1,500
Estimated cost of 10-inch 30-caliber gun for charge equal to one-half the weight of the projectile		$20,500
Alteration to "plant"		5,000

18-*inch brazed steel-wire gun, reinforced with wire, soldered.* (Plate VII.)

Caliber	inches..	18
Weight of projectile	pounds..	2,500
Weight of powder charge	do....	1,250
Length of bore	calibers..	30
	=inches..	540
Length of gun	inches..	576
Greatest diameter	do....	78
Weight of gun	pounds..	384,000
Maximum diameter of powder chamber	inches..	21.9
Length of powder chamber	do....	120
Capacity of chamber	cubic inches..	44,550
Density of loading		0.85
Maximum powder pressure (estimated)	pounds..	39,105+?
Muzzle velocity	feet per second..	2,073
Muzzle energy	foot-pounds..	166,896,598
Muzzle energy	foot-tons..	74,507.41
Penetration in iron (by Colonel Maitland's formula)	inches..	61.86
Estimated cost		$120,000
Addition to "plant"		75,000

L. R., No. 279.] NEW YORK, *May* 3, 1882.

THE BOARD ON HEAVY ORDNANCE AND PROJECTILES:

GENTLEMEN: I have the honor to state that in extending the length of the cast-iron wire-wound gun proposed and illustrated in drawing No. 2 to 30 calibers, retaining the weight of the charge at 100 pounds, the only changes I would propose would be the addition of 50 inches of length to the muzzle, a corresponding change in the position of the trunnions (so that they should still have the position of the center of gravity), and, taking advantage of this change, bringing the covering of wire as far forward as the new position of the trunnions would permit.

Very respecttully, your obedient servant,

W. E. WOODBRIDGE.

Remarks on tensile tests of brazed wire specimens for longitudinal strength.

W. E. WOODBRIDGE.

L. R., No. 263.] WASHINGTON, D. C.,
April 5, 1882.

TO THE BOARD ON HEAVY ORDNANCE,
New York City:

In order that correct inferences may be drawn from these tests it is important that several facts connected with them should be borne in mind, and it is thought the following suggestions may not be out of place:

1st. These tests show, in perfect specimens, only the resistance which is derived from brazing; the resistance resulting from the obliquity of the winding is not represented. If a tube were wound with wires having an inclination of 27° to the plane of rotation, in reversed spirals, fastened at the ends only, they would afford a longitudinal resistance equivalent to their lateral resistance, without soldering; but if it were possible to take from them a specimen of such form as is employed for longitudinal tests it would, of course, exhibit no coherence. Both kinds of resistance just mentioned must therefore be taken into account in judging of the longitudinal resistance of a gun.

2d. For the best test of a perfect composite specimen, when the components differ as do bronze and steel, it is peculiarly requisite that the strain should be so applied that there will be no distortion of the specimen (or tendency thereto) by bending laterally. When such distortion exists, or a strain tending to produce it, the brazing on the convex side of the specimen (or the one inclining to be such) is first or more severely strained, and the rupture is in some degree successive, whereas the whole of the uniting metal should be brought into resistance at the same time.

If the structure of the specimen is such that the arrangement of the components is symmetrical with regard to the axial line, it is sufficient that the direction of the strain should be strictly conformable to that line; but this condition of the specimen is one of rare occurrence and difficult to attain. In the absence of the structure mentioned, the resistance of the specimen upon one side will be greater than upon the other, and it will be bent (or first broken) in the direction of the weaker side.

3d. With specimens that are imperfectly united, the resulting want of symmetric resistance is liable to be very considerable, and the differences between the actual cohesion of the joining metal and the resistance of the specimen may be great. It is probable that a want of union to the extent of one-fourth of the area of cross-section, located at one side of that circle, would interfere with the resistance of the remaining three-fourths (by inducing successive rupture) so far that it would not amount to more than one-half or one-third of that due to direct cohesion.

4th. The preparation of composite specimens is one of much more delicacy than that of ordinary homogeneous materials.

There is a phenomenon in turning, taking place daily before the eyes of experienced workmen, often wholly overlooked. I refer to the superficial transformation of the metal by the turning-tool. It is impossible

to avoid some superficial change, even with the utmost care and skill. The metal lying outside of the circle of rotation limited by the edge of the cutting tool is displaced, to a slight extent, before it arrives at the edge; and this change is, of course, communicated in some degree to the metal in immediate connection with it, lying within that circle. It is evident that the employment of a dull tool will increase the effect just referred to, as will also the use of a tool which closely approximates the radial line in the direction of the surface opposed to the metal to be removed; and in both these cases the effect is enhanced by taking a heavy cut. But there is another way in which the metal is superficially transformed, depending on the *setting* of the tool. When a cold-chisel is employed in removing metal, a force equal to that which effects the result is brought into action against the surface from which the metal is detached; and the condition of the contiguous metal is virtually the same as if it had everywhere been subjected to the blows of a hammer. So, too, a lathe-tool often *leans* (so to speak) upon the unremoved metal for its support in its effort of detaching that which it removes. It is by no means always an unskillful workman who resorts to this method of turning. It is usually a safe one for the tool. Nor is it usually resorted to with any thought of any effect it may have upon the metal, or even of its mechanical action. Doubtless many a good workman, so far as accuracy in the production of form and the fitting of parts are concerned, would be incredulous in regard to its having any effect upon the metal; but it is utterly unsuited for turning specimens for tests. There are at the same time a special temptation and a special objection to its employment in turning composite specimens such as those of brazed wire. The want of uniformity in the material brings a varying strip upon the tool every time it passes from wire to wire, and the adjustment which supports the tool in large part, by leaning against the metal, is much easier than that which enables the cutting edge to make its slight retrocession under increased strains, in the line of its work, without tendency to lateral displacement.

When the specimen is of homogeneous extensible material, the change in its exterior layer, which may be regarded as an envelop striving to detach itself by both circumferential and longitudinal expansion (for such is the effect of localized pressure transferred successively to every portion of the surface), serves both to aid and to resist the action of tensile strain. Under such strains as the specimen can bear without carrying its extension beyond the obliteration of the tendency of the "envelop" to expand longitudinally, the tendency just mentioned aids the extending force. Carrying the strain beyond this point, the influence of the "envelop" is in the contrary direction, resisting the contraction of the specimen in its diameter (which is an aid to its resistance to longitudinal strain), and by the increase of tensile strength which accompanies the changed condition of its material, aiding directly the opposition of the specimen to tensile force.

But, in a specimen where the work to be done is the separation of soldered surfaces, the intervening metal being steel, the extension required is so slight that only the extending force of the enveloping portion can be brought into play.

As an exaggerated illustration of the amount of this force, reference may be made to the extension of rods in screw-cutting with ordinary dies, in which the mechanical action is very much the same, though more conspicuous.

There is still another action of the turning-tool in incautious hands which may greatly affect the condition of the specimen. A badly ad-

justed tool, or one of faulty temper which cannot be made to keep an acute edge, is forced against the specimen so as to spring it, too slightly to be observed, perhaps, but enough, when occurring on every side and reversed with every revolution, to leave its impress on the condition of the specimen in its whole thickness.

In a homogeneous specimen this action would be distributed through the whole extent of the specimen subjected to it. But in a composite one, such as we have referred to, the action would be in a great measure localized in the soldering metals, which, being very small in mass, would be very susceptible to injury. Still more would this be the case if the specimen were in any degree imperfect.

Whether any of the defects of preparation which have been mentioned occurred in connection with the specimens tested is, of course, unknown to the writer, and it would be unfair to assume them. The liability of their occurrence, however, deserves recognition. Circumstances that, without reflection, would appear trivial, may lead to a faulty and far too low indication of the strength the specimen would have in its position in the gun where there is no tendency to distortion or sidewise strain.

The want of a normal application of strain to the imperfect specimens was unavoidable.

Perhaps some indication of how great an influence such want really has upon the result of tests may be found in one of the tests already reported to me. The strain highest but one withstood by the specimens for longitudinal resistance was 37,500 pounds per square inch.

The amount of the strain is presumptive evidence of at least the rela tive perfection of the specimen. Yet it is noted that the fraction was "70 per cent. through wire." Taking the strength of the wire to be 75,000 pounds per square inch (much below the average in the tests), the resistance of the 70 per cent. of steel alone should be 52,500 pounds.

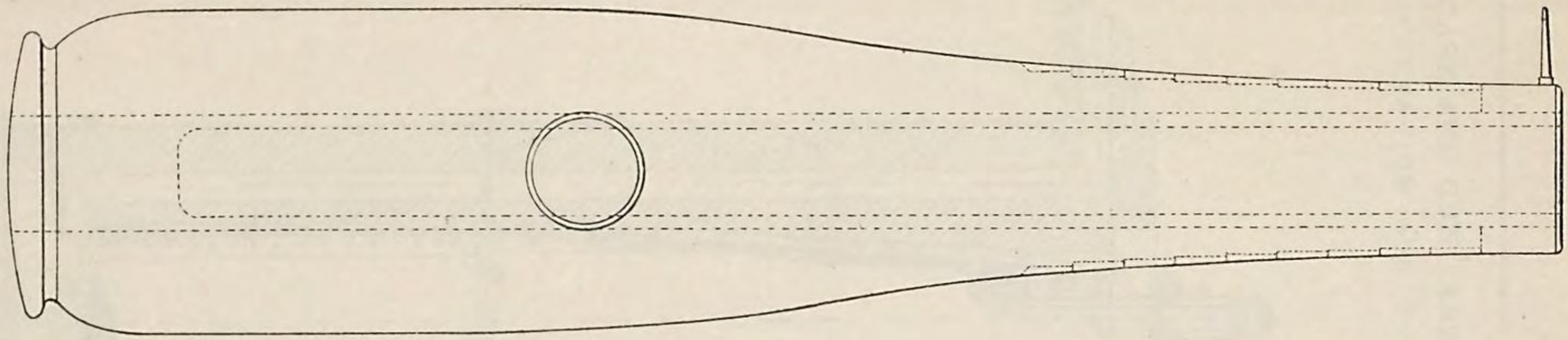
Is not this difference from the actual result to be attributed to the [unavoidable] faulty application of strain?

It should be remembered that the perfect test of a perfect specimen gives but the normal result of brazing; and that to it must be added the strength arising from oblique winding, if we would estimate the longitudinal resistance of a well-brazed gun.

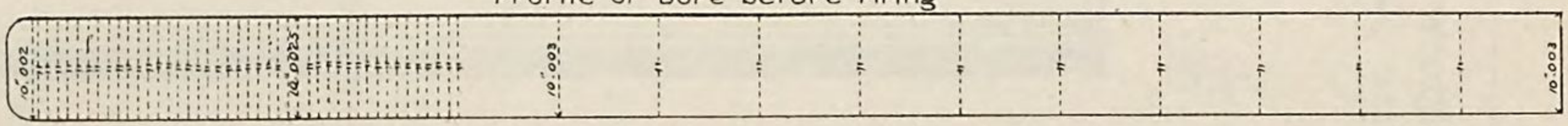
SEN. EX. DOC. No. 178, 1st SESS., 47th CONG.

WOODBRIDGE 10-INCH RIFLE.

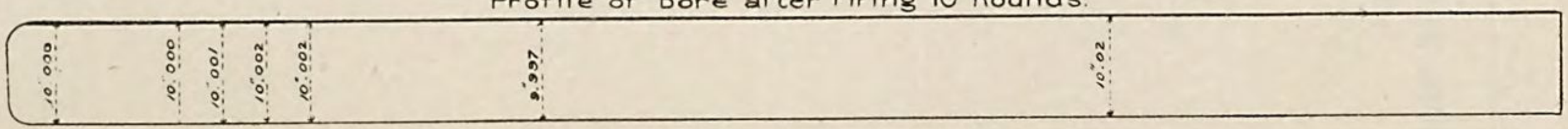
FRANKFORD ARSENAL, 1875.



Profile of Bore before Firing



Profile of Bore after Firing 10 Rounds.



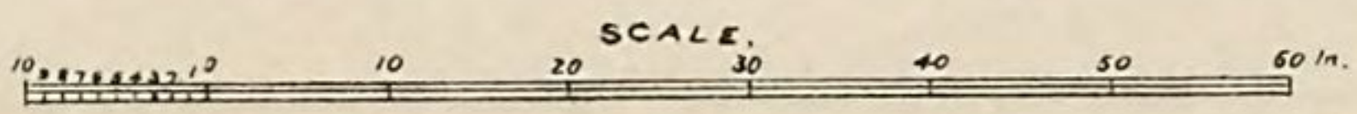
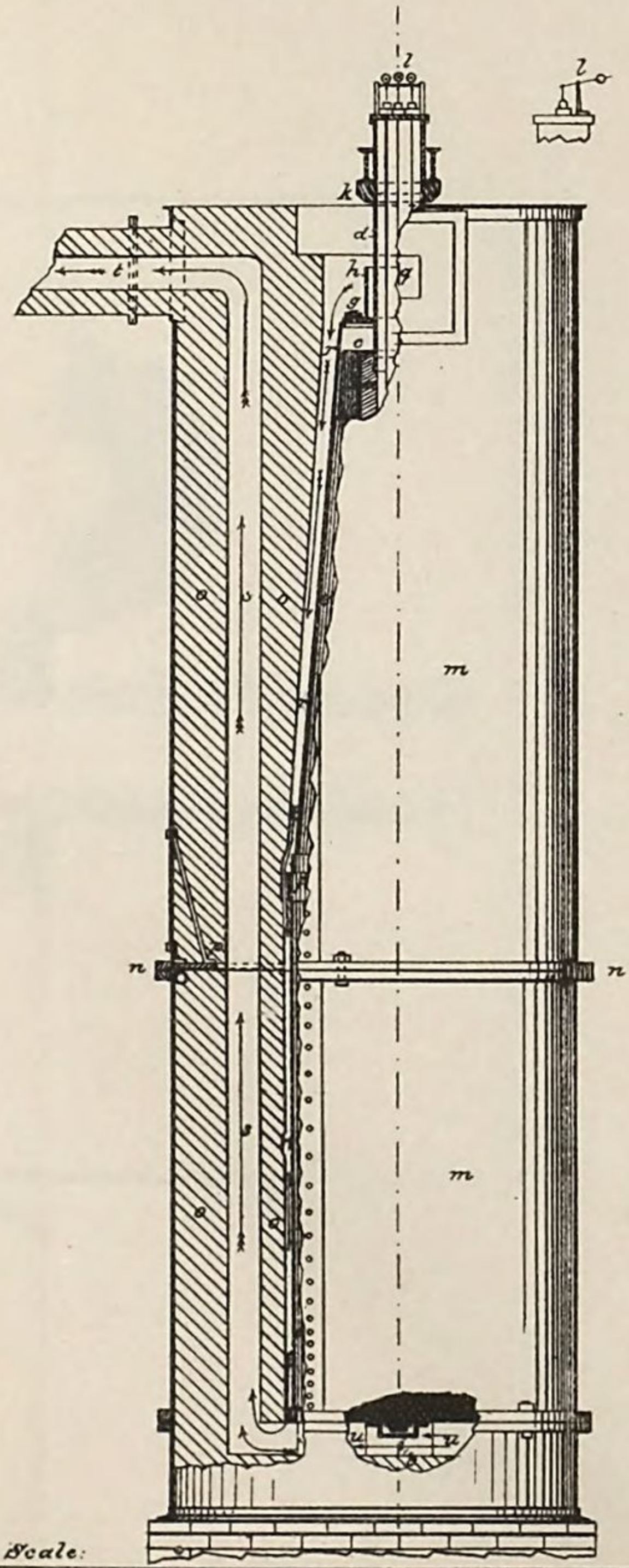


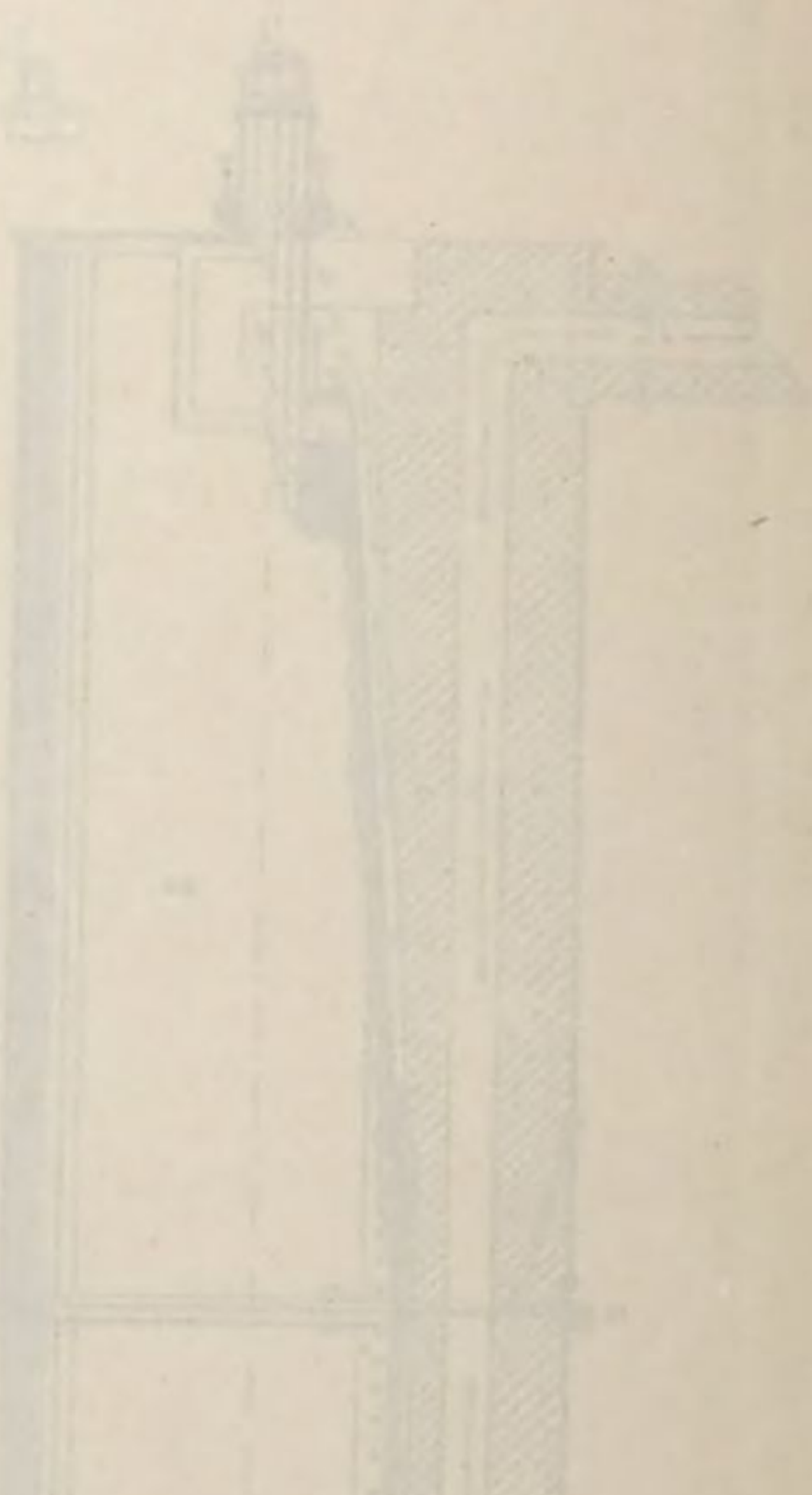
PLATE I

PLATE II.

HEATING CASE AND GUN CASE OF WOODBRIDGE GUN. (9.")

ELEVATION AND PARTIAL SECTION.



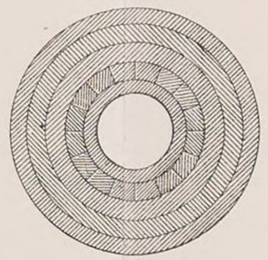


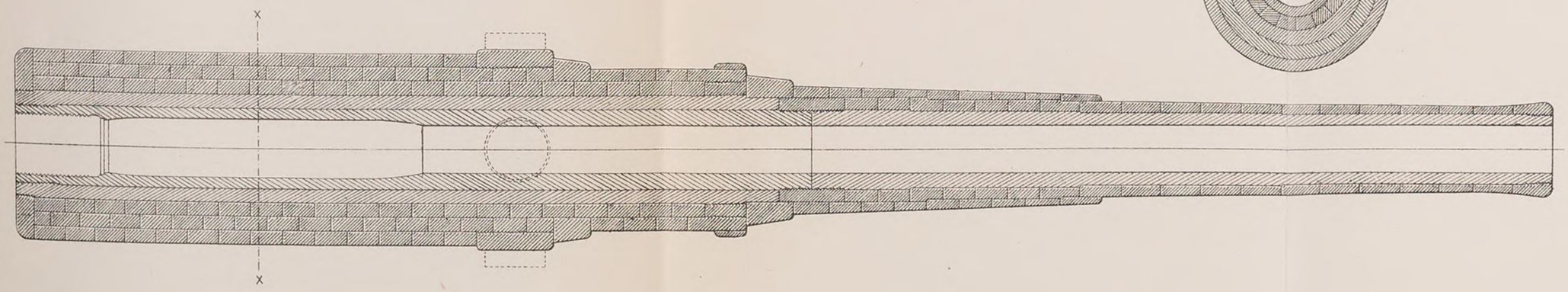
12-INCH STEEL GUN. LONGITUDINAL BARS: BANDED. 30 CALS.

Bars and Bands cold-hammered.

—— PROPOSED BY W. E. WOODBRIDGE. ——

Section on X.X.





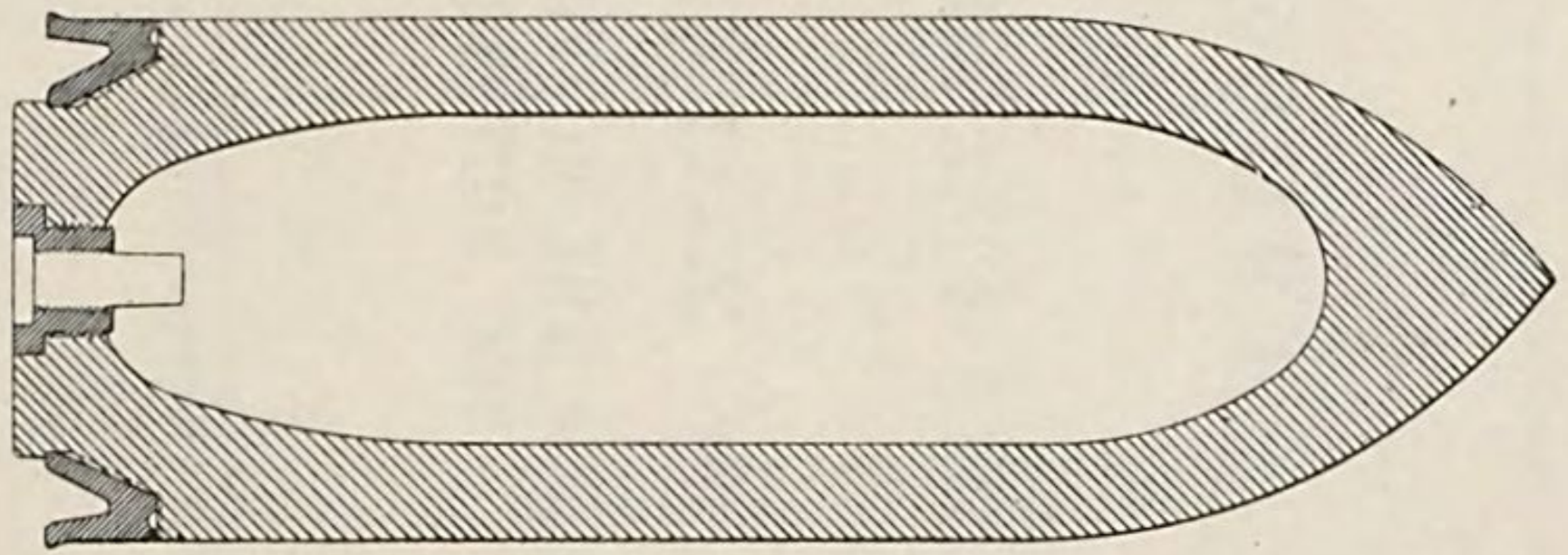
Scale:

10 5 0 10 20 40 60 80 100 Inches.

RIFLE PROJECTILE

—— PROPOSED BY W. E. WOODBRIDGE. ——

Sabot of 1850, modified.



REPORT

OF THE

BOARD ON HEAVY ORDNANCE AND PROJECTILES.

APPENDIX VI.*

GENERAL INFORMATION ON THE SUBJECT OF GUN CONSTRUCTION, ETC.

* By direction of the Senate, a part of Appendix VI is not printed.

GENERAL INFORMATION ON THE SUBJECT OF GUN CONSTRUCTION
&c.

L. R. No. 233.] ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, January 26, 1882.

General GEORGE W. GETTY,
President Board on Heavy Ordnance, &c.,
New York City:

SIR: I have the honor to transmit herewith, for the information of the Board, certain extracts from foreign publications relative to steel-wire or steel-riband guns, as showing the most modern tendency of ideas in Europe regarding gun construction.

The steel-wire system possesses unmistakably the promise of great merit, such as great lightness and strength, combined with simplicity of fabrication and cheapness; but, in the absence of any but the most meager reports of its actual trial with large calibers, it is hardly safe to say that it has been in all respects worked out as yet to a practical success.

It is to be regretted that the inclosed notices are of so brief and cursory a character; nevertheless, they are valuable and instructive as directing attention to the fact that opinion and experiments abroad seem to favor the recognition more and more of these two important principles in the fabrication of heavy cannon, namely, the employment of steel entirely, to the exclusion of all other metals, as the most suitable material; and the application, to its furtherest practical limit, of the principle of building up in contradistinction to homogeneous or simple cast guns.

It is claimed, indeed, by the advocates of the latter weak system, that the improvements that have been made during recent years in gunpowders and projectiles now assure the safe employment even of cast-iron guns of heavy caliber. To this it must be answered that, even admitting that the ordinary strains will lie within the safe limits of endurance of the gun, yet, and it should not be forgotten, all rifled cannon, and particularly cannon chambered for large charges, are subject to exceptional strains of great intensity, arising from irregularity in loading, from inequality of the powder, or from some obstacle to the free passage of the projectile through the bore. The resistance of the gun, then, must be equal to the heaviest strain put upon it in any of these emergencies, and the demand for the strongest possible gun is just as urgent to-day as at any time in the past. The gun must be strong enough to endure, not the ordinary pressure only, but also the extraordinary pressure to which at any time it may be subjected.

But, again, if cast iron guns were once abandoned for the stronger built-up guns, why should we now return to them, when the great problem of the day is how to secure the gun of greatest power commensurate with our facilities for fabrication? If the built up gun was better able to endure the more destructive powders of the past than the cast iron simply because it was a stronger gun, why should not its greater

strength be utilized to-day in the attainment of a greater *power* than is admissible with cast iron?

If *maximum power* is the object aimed at in the construction of modern artillery, there can be but one answer to this question. Indeed, stronger guns, not weaker ones, than even the best guns of the past are really what is needed to cope with modern conditions of resistance to gun-power; more work is required from a gun now than formerly; and any increment of work that can with safety be exacted from it will be in full proportion to the increase of strength.

In this connection I would call the attention of the Board to the statements and remarks published in "Ordnance and Armor," by Holly, pages 308 to 327, and pages 331 to 334. It will scarcely be claimed that any material improvement has been made in the production of cast-iron guns since the date (1865) of that publication; cast iron at that time had reached its highest standard.

In the pages referred to there is certainly conceded to cast iron all that its most enthusiastic admirers can justly claim for it, while at the same time there is pronounced that calmer judgment that naturally follows upon a consideration of average rather than of exceptional results.

Respectfully, your obedient servant,

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

I.

THE SCHULTZ STEEL-WIRE GUN.

[Extract from the Revue Maritime et Coloniale for August, 1881, pp. 269, 270.]

A process of fabrication which we will readily term "the process of the future," because it surely admits of conciliating relative lightness with great resistance, and therefore with great power, is the *steel-wire system*. Captain Schultz is the convinced advocate of this system in France, the decided advantages of which were long ago demonstrated in England, both theoretically and practically, by the civil engineer Longridge.

These advantages were not lost sight of by the Navy Department, and to prove, in all their bearings, the merits of the system, two cannon, one of 10^{cm} (3.94 inches), and the other of 34^{cm} (13.39 inches), have been placed under fabrication in the works of Fives-Lille.

The principle involved in their construction may be summarized as follows:

1st. Division of the cannon into two parts, each of which is designed to resist alone one of the two strains produced in firing, namely: the steel tube, wrapped with steel wire, which sustains the effect of the expansion of the gas in the direction of the radius only; the nut for the breech-screw, connected by bolts to the trunnion-band, the bolts resisting the effort to blow out the breech.

2d. The employment of a steel-wire wrapping, put on under a determinate tension, for the hooping of the gun. By this process not only can the tension of the wire, rolled successively around the gun, be rigorously determined by means of a weight, a fact that cannot be definitely ascertained with the ordinary hooping where the shrinkage always remains more or less uncertain, but, furthermore, the good quality of the steel wire is insured, for the very operation of wire-drawing constitutes a test that eliminates all defects. The wire employed

possesses a resistance of 284,000 pounds per square inch, while for the ordinary steel hoops the resistance is scarcely 92,000 pounds, and even then there is no guarantee against defects.

The plans have been drawn up by Captain Schultz in accordance with an understanding had with the inspector-general of artillery. Following are some of the principal data relative to the two guns, viz:

		Caliber, 10^{cm}.	Caliber, 34^{cm}.
Total length	feet	9.68	30.41
Length of bore	do	8.86	28.99
Length of bore	caliber	27.3	26
Weight of gun (P)	pounds	2,704	108,379
Weight of projectile (p)	do	26.4	924
$\frac{P}{p}$		102	117

The diameter of the powder chamber is sensibly greater than that of the bore, and its capacity is sufficient to admit of the employment of a weight of charge equal to one-half the weight of the projectile, with the realization of more than 1,968 feet velocity.

II.

THE SCHULTZ 34^{cm} STEEL-WIRE GUN.

[Extract from the Memorial de Artilleria of October, 1881, Madrid.]

The piece is composed of an inner steel tube of 5.5 inches maximum and 3.94 inches minimum thickness, and having a total length of 31.06 feet. From the breech as far as the middle of the chase it is wrapped with steel wire of 0.118 inch diameter, by which the thickness of the wall is increased 4.53 inches from the breech to the axis of trunnions and 2.26 inches for the remainder of the wire-wrapped portion.

A cast-iron casing 0.98 inch thick covers the entire wrapped portion, the object of which is not to support pressures, but simply to inclose and protect the wires.

The interior diameter of the chamber is 14.57 inches; that of the bore proper, 13.39 inches. The length of the chamber is 53.15 inches; the total length of bore is 28.9 feet.

A steel disk 59 inches in diameter and 3.94 inches thick is attached to the piece in rear of the chamber and concentric with it. Twelve cylindrical steel tie-rods, 3.74 inches in diameter, connect this disk with a similar one situated in the axis of the trunnions, the object of which disposition is, to all appearances, to sustain the pressures on the bottom of the bore.

In order to wrap on the wire, the tube of the cannon is placed in a simple but strong machine that admits of being turned about its axis. At 13 feet to one side is a spindle of timber and iron, similar in form to the cannon, and mounted on a similar apparatus. Between the two is a trench $6\frac{1}{2}$ feet deep by 4.9 feet wide, on the borders of which work pulleys 29.5 inches in diameter. The wire is wound upon the spindle, from whence it passes to the pulley fixed on the edge of the trench, from thence to a movable pulley suspended near the trench, carrying a 2,200-pound weight, and finally to the steel tube.

This apparatus being slowly turned, the wire is wrapped upon the

tube under a tension of 1,100 pounds, and after divers trips with the weighted pulley, running over the trench throughout the entire length of the cannon, the operation is terminated.

The steel wire used for the 34^{cm} gun has a diameter of 0.118 inch, and its resistance is 284,000 pounds per square inch; the total resistance will be 2,007,880 pounds. Thus the mass of enveloping wire offers four times the resistance of cast steel.

The pressure extended by the wire upon the steel tube is sufficient to contract its diameter .079 inch.

The weight of the gun amounts to 50 tons, and although the cost cannot be fixed until the current fabrication is known, it would appear as if it has actually cost less than 28,000 francs.*

The results of the trial of this gun have not as yet been published, although it has actually been fired; but it is positively known that pressures of 42,600 pounds per square inch of bore have been endured without the slightest injury to the gun.

The initial velocity with ordinary charges was 1,968 feet, as had been calculated.

III.

THE ARMSTRONG 13-INCH STEEL RIBAND GUN OF 43 TONS.

[Extract from the Engineer of July 29, 1881.]

To pass on to another 43-ton gun. In Fig. 9 is shown one strengthened with coils of steel riband. The whole of the gun, from breech to trunnion hoop, is made of steel; the portions which are made of wrought iron or steel riband are so marked in section, the unmarked parts being of steel. We have used the word "trunnion hoop" to describe the part known to artillerymen by that name. This gun, however, has no trunnions, being held in a saddle by the square cut rings shown on the lower surface. This gun is a much larger one than those of which we have just been speaking; the bore is 13 inches, against 12 inches in diameter; 13-inch and 12-inch projectiles of similar proportions, fired with the same velocity, would have stored-up work in the proportion of five to four, roughly speaking. The details as to charges, projectiles, and velocity have not yet been worked out practically, but the following is an approximate estimate.

The 12-inch* gun, with a charge of from 315 to 325 pounds, and a projectile of 700 pounds, will have a muzzle velocity of from 1,950 to 1,970 feet, implying an energy of about 18,650 foot-tons. The 13-inch gun, with a 500-pound charge and a 1,000-pound projectile, may attain an initial velocity not far short of 2,000 feet per second, having about 27,460 foot-tons stored-up energy. Such results would argue greater proportional power for the 13-inch gun than the 12-inch, and far exceed the estimate made in France, that steel wire bears to solid steel in the same quantity strength in the proportion of four to three.

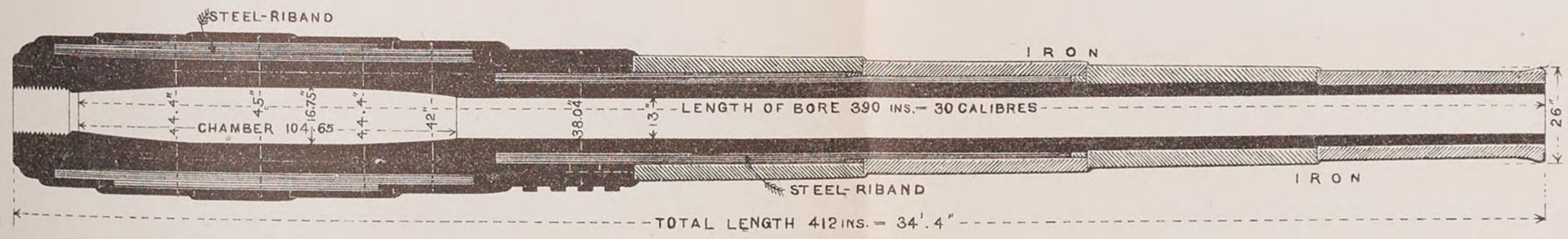
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* Mr. Longridge, of London, stated before a meeting of the Royal United Service Institution in June, 1879, that he had received offers from manufacturers to make a gun of 100 tons on his principles (steel-wire system) at a cost of from £35 to £40 a ton, say, $17,500 to $20,000 for the gun. This is a reduction of from four-fifths to three-fourths on the cost of the Woolwich gun, and the time required for its fabrication is decreased in about the same ratio.

In the course of his remarks Mr. Longridge stated: "As regards the wire system, it has been tried in America. Woodbridge's gun is built on the wire system, but, in my opinion, they have completely spoilt the gun, and made it cost an enormous deal by casting an immense mass of bronze around the wired tube. This has injured the gun, and made it cost three times as much as it ought to have done."—(Journal of the Royal Service Institution, vol. xxiii, No. ciii, 1879.)—NOTE BY THE TRANSLATOR.

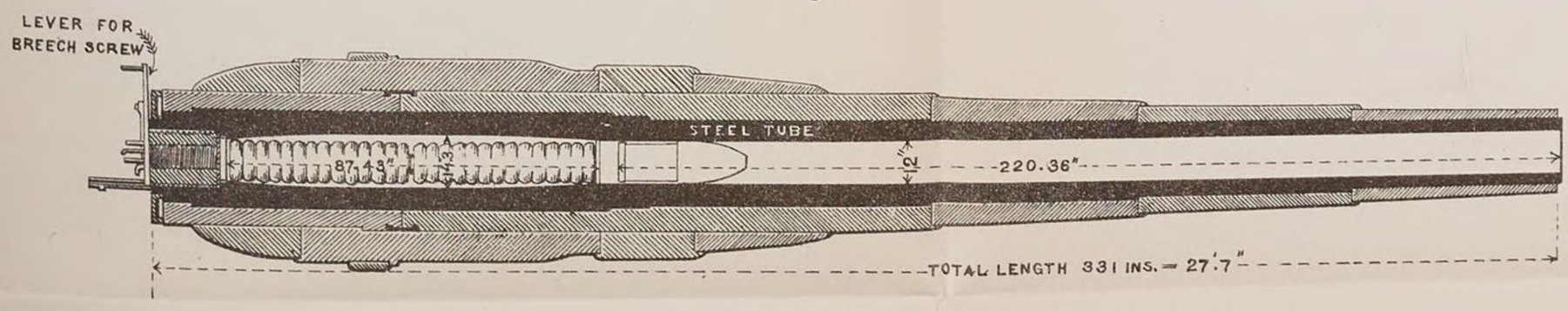
ARMSTRONG 13-INCH STEEL-RIBAND GUN

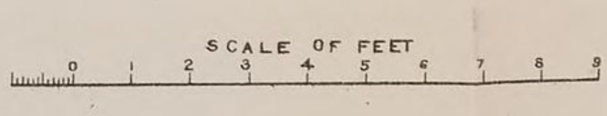
Fig. 9.



ARMSTRONG 12-INCH BREECH-LOADING GUN.

Fig. 7.





As to proportions, the riband 13-inch gun has a length of bore of 390 or 30 calibers, against about 312 or 26 calibers length in the 12-inch gun. The chamber of the former is 8 calibers long against about 7½ in the latter. As to the arrangement of the riband coil, it will be seen that it is only carried out to a certain extent; there is no longitudinal application of riband in this gun.

ORDNANCE OFFICE, WAR DEPARTMENT,
L. R. No. 275.] *Washington, April* 29, 1882.

The BOARD ON HEAVY ORDNANCE, AND PROJECTILES,
New York Ctiy:

GENTLEMEN: I have the honor to submit herewith, for the information of the Board, records of firing with the 6-inch and 10.236-inch Armstrong steel riband guns, received this day from Sir William Armstrong & Co.

In their accompanying letter, Sir William Armstrong & Co. state that a large number of rounds have already been fired from the 6-inch gun, and the experiments with the 10.236-inch gun are about to be continued by their own government, which has purchased the gun and hydraulic carriage, and intends to carry out an extensive series of experiments with it at Shoeburyness.

Respectfully, your obedient servant,

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

Results of experiments with a 6-inch B. L., gun of 35 calibers.

Rounds.	Weight of charge in pounds.	Weight of shot in pounds.	Initial velocities.	Pressure in chamber.	Energies, foot-tons, total of shot.
			Feet.		
.....	55 P.	80	2,176	T. 14.8 B. 14.8 S. 11.6	2,626.6
.....	55 P.	90	2,073	T. 14.8 B. 15.15 S. 13.25	2,681.8
3	55 P.	100	1,960	T. 14.8 B. 15.22 S. 15.2	2,663.8
4	55 P.	110	1,881	T. 14.94 B. ..... S. 15.6	2,698.7
5	55 P.	80	2,297	T. 21.9 B. 20.75 S. 20.6	2,926.8
6	55 P.	90	2,202	T. 21.2 B. 20.82 S. 20.9	3,026.0
7	55 P.	100	2,121	T. 20.8 B. 21.26 S. 21.3	3,119.4
8	55 P.	110	2,032	T. 20.82 B. 21.26 S.	3,149.4
.....	50 P.	90	1,935	T. 10.2 B. 11.78 S. 11.1	2,336.6
.....	50 P.	100	1,991	T. 14.4 B. 15.0 S. 14.2	2,748.7

* Of the usual Armstrong construction, shown in Fig. 7.

Results of experiments with a 6*-inch B. L., gun of* 35 *calibers*—Continued.

Rounds.	Weight of charge in pounds.	Weight of shot in pounds.	Initial velocities.	Pressure in chamber.	Energies, foot-tons, total of shot.
			Feet.		
11	55 P.	120	1,842	T. 15.9 B. 15.3 S.	2,823.2
12	55 P.	110	2,029	T. 21.8 B. 20.82 S.	3,140.1
13	60 P.	120	2,064	T. 21.8 B. 20.82 S.	3,544.8

Results of experiments with 10.236*-inch gun.*

[Total weight of gun, 21 tons 4 cwt.; total length, 317 inches; length of bore, 300 inches.]

Rounds.	Weight of charge in pounds.	Weight of shot in pounds.	Initial velocities.	Pressures in chamber.	Energies, foot-tons, total of shot.	Remarks.
1	230	501½	1,858	19.3 18.5 S. 14.7	12,005	Prismatic lot 48.
2	240	495	1,893	20.4 18.9 S. 15.1	12,300	Do.
3	240	497	1,928	23.9 22.4 S. 17.8	12,810	Prismatic lot 70.
4	250	502	1,930	22.5 22.5 S. 20.0	12,966	Prismatic lot 48.
5	260	500	1,943	30.0 29.1 S. 28.4	13,089	Do.
6	260	504	1,944	20.1 20.5 S. 19.4	13,207	Prismatic lot 67.
7	260	502	1,940	21.4 21.2 S. 18.0	13,101	Prismatic lot 48, zinc tube.
8	280	507	2,012	22.1 21.9 S.——	14,063	Prismatic lot 67, zinc tube.
9	300	498	2,076	23.1 22.8 S.——	14,882	Do.
10	280	504	2,011	22.3 22.5 S. 19.5	14,133	Prismatic lot 48, zinc tube.
11	290	503	2,020	23.0 24.2 S. 20.5	14,232	Do.
12	290	501	2,056	24.1 24.4 S. 21.2	14,685	Do.
13	280	502	2,090	28.7 27.9 S. 20.4	15,205	Prismatic lot 70, zinc tube.
14	290	503	2,146	28.7 30.1 S. 20.8	16,062	Do.
15	300	502	2,105	34.5 35.1 S. 30.8	15,424	Prismatic lot 48, zinc tube.
16	260	500	1,974	19.5 19.3 S.——	13,510	Prismatic lot 67, zinc tube.

ORDNANCE OFFICE, WAR DEPARTMENT,
L. R. No. 280.] *Washington, May* 3, 1882.

The BOARD ON HEAVY ORDNANCE AND PROJECTILES,
New York City:

GENTLEMEN: I have the honor to submit herewith a revised price list of foreign ordnance. These prices have been obtained from authentic sources; but in one instance, the French steel gun, there is noted a considerable discrepancy in the price given from that obtained from other sources. I am unable to say which price is correct; that on the list was obtained from a source of undoubted authority, but in transmitting, copying, &c., an error may possibly have crept in.

Respectfully, your obedient servant,

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

Cost of European guns.

Nature.	Caliber in inches.	Weight in tons.	Cost per ton.	Remarks.
Whitworth 17.78cm	9.75	8.02	$824	All steel.
Woolwich	.....	.... ..	584 to 727	Wrought-iron tubed with steel. The larger the gun, the less the cost per ton.
Armstrong	.....	.....	727 to 800	Wrought-iron tubed with steel.
Krupp 35.5cm	13.98	51.18	1,300	All steel.
Krupp 30.5cm	12.00	35.43	1,012	
Krupp 26.0cm	10.23	21.65	941	
Krupp 15.0cm	5.9	4.97	1,076	
Krupp 15.0cm	5.9	3.94	1,176	
Krupp 15.0cm	5.9	3.44	1,074	
French 24cm (L. S.)	9.45	15.91	349	Cast-iron hooped and tubed with steel.
French 24cm (L. S.)	9.45	13.75	*1,028	All steel.
Italian 24cm short	9.45	14.91	305	Cast-iron hooped with steel.
Italian 24cm long	9.45	17.02	307	
Italian 32cm	12.6	37.4	259	
Italian 45cm	17.72	99.0	293	

* The cost of the French 10.63-inch (27cm) steel gun is given by Captain Gadaud in his "Carnet de Notes et Renseignements, 1881, approximately at $762 per ton, and of the 13.38-inch (34cm) steel gun at $684 per ton.

ORDNANCE OFFICE, WAR DEPARTMENT,
L. R. No. 247.] *Washington, February* 16, 1882.

Gen. GEORGE W. GETTY,
President Board on Heavy Ordnance, &c., New York:

SIR: Herewith I have the honor to transmit, for the information of the Board, a copy of Col. T. T. S. Laidley's report of the 25th of June, 1881, to the Chief of Ordnance, on the trial of two cast-iron guns, one of which was lined with a wrought tube. In forwarding these papers to the Board I deem it proper to remark—

1st. The body or casing of the lined gun was a *defective casting*, a cavity being found in it that necessitated drilling into the metal 1.25 inches in depth in order to remove it. Such a cavity shows unsound metal. Its size was such as would have more than justified the *rejection* of the casting, under the limits of variation prescribed in Ordnance Manual for the inspection of cannon. (Ordnance Manual, p. 29.)

The report fails to state either the diameter or location of this cavity, whether situated at the muzzle, the base of the breech, or near the middle of the gun, where the strains are much the heavier.

2d. The two guns differ materially as to length of bore. In the lined gun the bore terminates at a point 1.1 inches nearer the muzzle than in the other. The effect of this was to place and explode the charge under an actually less average thickness of walls, and the thinner portions of the chase were more quickly reached, for the same expansion of the gases, and consequently were subjected to a much heavier strain than in the unlined gun.

The trial was between a fac-simile of the 8-inch converted rifle, and another gun in which there was practically a different distribution of the metal about the bore. The question, therefore, of the relative merit of lined and unlined cast-iron guns, if that were the object of these trials, was complicated with one of mere *design*.

The thickness of metal in the breech of the lined gun would have admitted of making the two bores of an equal length.

3d. This report is deficient in any statement of the pressures to which the guns were respectively subjected during the tests. In the absence of such a record it is inadmissible to say that the two guns have been subjected to strains of equal intensity. The pressure exerted by fired gunpowder on the walls of a gun is controlled almost to an unlimited extent by the relation that the volume of the charge bears to that of the *space* in which it is fired. The smaller that space the higher will be the pressure, and the larger it is the lower will be the pressure.

It is chiefly in virtue of this principle—termed the principle of air-spacing—that modern artillery has attained to its enormous increase in power. If the projectile is pushed harder "home" in one instance than in another, thus diminishing the air-space in the charge, or if the diameter of the cartridge is greater at one time than at another, thus giving rise to a more rapid rate of combustion, in either case the pressures on the walls of the bore will be increased.

It is affirmed in the letter accompanying the report that "the *stretch* of the metal is an accurate measure of the strain that effected it." If this can be conceded, when the *stretch* is to be made the standard of comparison between metals so widely varying in the property of extensibility as cast iron and wrought iron, then the question presents itself as one of two alternatives. Was the greater stretch of the lined gun due to its being subjected to heavier pressures, or to the fact of its possessing a less resistance? It was the object of these experiments, it is believed, to furnish an answer to the latter inquiry, and had the pressures been determined by means of a pressure-gauge, the relative strength might have been inferred from the respective endurance of the guns. So far as these trials are concerned, *that* point must remain in uncertainty.

The great resistance displayed by a 7-inch Palliser rifle—cast iron lined with wrought iron—in tests recently made in England, and the trial of an 8-inch converted rifle, chambered, at Sandy Hook, in which the piece safely endured pressures exceeding 70,000 and 100,000 pounds per square inch, after having previously been fired considerably more than 100 rounds of 55-pound charges, would seem to require that the results of these trials be received with caution.

4th. The lined gun gave way at the fifth round, rupture taking place quietly,* the three pieces into which the gun separated not becoming wholly detached from one another. The unlined gun burst violently at the sixth round; the fragments were forcibly projected against surround-

* A Palliser 6.3-inch rifle burst in similar manner recently in Spain.

ing objects. These facts alone are favorable to the lined gun, if any regard is to be had for the lives of cannoneers in service.

5th. As regards the views of Rodman, Mallet, and Rosset upon materials for cannon and modes of gun construction, it is but just to them to state that General Rodman was a member of the Ordnance Board of 1868, that "earnestly recommended" the fabrication and trial of a 10-inch and of a 12-inch cast-iron rifle *lined with steel;* that Mr. Mallet was a well-known advocate of wrought iron and of low steel as against cast iron, as the best material for cannon, and of a built-up construction as against a simple casting, as the best mode of fabricating heavy guns, and that the name of General Rosset is intimately associated with the Italian system of construction, which is a cast-iron body strengthened by rows of steel hoops.

The experiments of General Rosset demonstrated, indeed, the superiority of steel to all other metals as the material for cannon, but the state of the industries in Italy limited the employment of this metal to a construction in which cast iron should largely enter.

The mechanical experiments of Rosset proved that an immense advantage is to be gained by lining cast iron with steel; that, so far as his particular experiments reached, lining cast iron with wrought iron was decidedly prejudicial to resistance—a result qualified by General Rosset's observation that, "if the relative thickness of the tube and the cast iron were varied"—from that employed in his experiments—"the results might be different, and it is probable, under certain conditions, that bronze and wrought iron might be used advantageously," and more generally by the cautionary notice running through his report, that the results of experiments made by means of statical forces, capable of annulling in part the elastic resistance of the metal, cannot be rigorously applied in cases where *dynamic* forces are concerned.

6th. The experiments made by Colonel Laidley with the testing machine, and referred to in his letter, were in every case with *lined cylinders*, and their strict connection with the trial of these guns is not apparent.

Respectfully, your obedient servant,

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

ORDNANCE OFFICE, WAR DEPARTMENT,
Washington, June 27, 1881.

Col. T. T. S. LAIDLEY,
Commanding Watertown Arsenal, Watertown, Mass.:

SIR: I have received your report of the 25th instant of experiments made to show the superiority of simple cast iron over cast iron lined with wrought iron for gun constructions.

Were it the object to determine their relative merits for smooth-bore field guns, these experiments might be valuable. The Department is, however, making cannon of large caliber, for fortifications, and these experiments throw no light on the merits of our conversions and original constructions.

Your request of October 28, 1880, to make similar trials was not approved because I believed that the results would not justify the expense. I am still of the same opinion.

The endurance of converted guns both here and abroad, when fired a large number of rounds with battering charges, would seem to be our safest guide.

Respectfully, your obedient servant,

S. V. BENÉT,
Brigadier-General, Chief of Ordnance.

WATERTOWN ARSENAL, *June* 25, 1881.

To the CHIEF OF ORDNANCE:

SIR: I have the honor to report that, failing to receive any reply to my letter of October 28, 1880, asking for authority to make certain experiments with the view of determining the relation between results obtained on the resistance of cast-iron cylinders by the testing machine, and corresponding results given by gunpowder, and seeing that the Department was not disposed to undertake them, the question came up, how could the experiments be made?

I had expressed in plain terms my opinion as to the value of the experiments made with the testing machine, and based conclusions thereon in regard to the advisability of continuing the conversion of smooth-bored guns into rifles. I had Rodman, Mallet, and Rosset all to confirm me in my opinion, and I was as certain as I could be of anything that I was not mistaken. It seemed to me that it was a matter of the greatest importance that we should know without peradventure, before going further with the fabrication of guns on the present adopted system, which made the stronger guns—cast iron plain and simple, or the same lined with a wrought-iron tube, and this information could be gained only by comparing the powder-proof of two small guns representing the two systems, and made and fired under precisely the same circumstances. I determined, in order to settle this question and others depending thereupon, to procure two small guns on my own account and trust to the Department paying for them if the result confirmed the correctness of my conclusions. I accordingly ordered from the South Boston Iron Company two 3.2-inch guns of a maximum diameter of 12.8 inches, and of the model of the 10-inch Rodman gun, without trunnions, and requested Capt. J. G. Butler, Ordnance Department, to take charge of their fabrication and inspection. One was bored out to receive a wrought-iron tube, made by the West Point Foundry, of the same metal as that used in making tubes for lining guns; the other was a simple cast-iron gun with the same bore and exterior dimensions as the other. These guns were fired alternately, with the same charges, as follows:

First round, 2.5 pounds powder, 1 shot of 22 pounds.
Second round, 2.5 pounds powder, 1 shot of 30¼ pounds.
Third round, 2.5 pounds powder, 2 shot of 60½ pounds.
Fourth round, 2.5 pounds powder, 2 shot of 60½ pounds.
Fifth round, 2.5 pounds powder, 2 shot of 60½ pounds. Lined gun burst.
Sixth round, 2.5 pounds powder, 2 shot of 60½ pounds. Cast-iron gun burst.

The object being simply to determine which was the stronger when subjected to the strain developed by gunpowder, the charge of 25 pounds was selected as representing the charge with which the converted guns were proved, and as in case projectiles of corresponding weight should

be used the proof would become a long and expensive one, I determined to use very heavy projectiles.

The cast-iron gun showed greater strength from the first measurement of the bore, after the third round, when the enlargement was only one-third that of the lined gun, and after the fifth round it showed less enlargement than the lined gun did after three rounds. The stretch of the metal is an accurate measure of the strain that affected it.

Considering the importance to the Department of the knowledge gained by these experiments, confirming fully as they do those previously given by the testing machine, and bearing in mind the great saving to the government that must result from this information, it becomes a matter worthy of consideration whether it would not be just, proper, and desirable that the Department should make these trials its own by assuming and paying the expense of them instead of allowing one of its officers to bear the burden alone. I supposed, when I made my report of September 11, 1880, that the Department would, without any prompting from me, do just what I have done; and it was only when I found that no such course was contemplated that I proposed to do it if authority were granted me. I am of course aware that, acting as I did without your authority in ordering these guns, I cannot claim it as a right that the government shall pay for them, but a great, prosperous, and rich nation cannot afford to take the ground that one of its servants must pay from his own pocket for an experiment which he made without adequate authority, and decline to bear the expense simply because such action invades no legal right, and no legal means can be taken to enforce compliance, when the great advantages therefrom inure solely to itself. An excess of zeal in the public service is a fault which can be pardoned, and is forgiven when nothing but good results to the service from such action, as in the present instance. The amount in this case is a mere trifle compared to the thousands of dollars that will be saved by the information gained, and the Department can well afford to pay ten times this amount for it.

I inclose herewith the bill for the two guns, and trust that you may be disposed to order it to be paid, and allow the Department to receive the credit of making the experiment.

I transmit herewith the report of Captain Butler giving a detailed account of the fabrication, inspection, and proof of the two guns. He has performed his task with intelligence, fidelity, and a strict impartiality.

Very respectfully, your obedient servant,

T. T. S. LAIDLEY,
Colonel of Ordnance, Commanding.

BOSTON, *June* 18, 1881.

United States Arsenal, Watertown, T. T. S. Laidley, colonel commanding, to the South Boston Iron Company, Dr.

To 1 cast-iron gun:	
1 casting dry sand gun, iron, 1,054 pounds, at 5½ cents	$57 97
Copper for vent, 1¾ pounds, at 30 cents	52
Drawing, 2 hours, at 45 cents	90
Pattern work, 13 hours, at 50 cents	6 50
Time on tools (machinist), 41 hours, at 50 cents	20 50
Machine work, 120¾ hours, at 60 cents	72 45
Machine work, 19¼ hours, at 50 cents	9 63
Machine work (helpers), 21½ hours, at 30 cents	6 45
	174 92

BOSTON, *June* 18, 1881.

United States Arsenal, Watertown, T. T. S. Laidley, colonel commanding, to the South Boston Iron Company, Dr.

To 1 cast-iron gun lined with tube and jacket, B. I.:

1 casting dry sand gun, iron, 1,054 pounds, at 5½ cents	$57 97
1 tube, $432; freight on tube, $1.20	433 20
Copper for vent, 1¾ pounds at 30 cents	52
Drawing, 6 hours, at 45 cents	2 70
Pattern work, 13 hours, at 50 cents	6 50
Time on tools (machinist), 41 hours, at 50 cents	20 50
Machine work, 270¾ hours, at 60 cents	162 45
Machine work, 19¼ hours, at 50 cents	9 63
Machine work (helpers), 40½ hours, at 30 cents	12 15
	705 62

[Indorsement.]

THE ORDNANCE BOARD, U. S. A.,
New York, July 15, 1881.

Respectfully returned to the Chief of Ordnance, U. S. A.

The Board attaches no especial value to these experiments undertaken by Colonel Laidley with a pair of miniature smooth-bore guns.

The attention of the Department is now directed towards the manufacture of breech-loading rifles of heavier calibers, as well as to the conversion of cast-iron smooth-bores into effective rifled breech-loaders.

If Colonel Laidley intends to advocate the use of cast iron pure and simple for the former, or to substitute a new construction of pure cast iron for the latter, the Board in either case differs with him most decidedly.

For the Board.

T. G. BAYLOR,
Lieutenant-Colonel of Ordnance, senior member present.

WATERTOWN ARSENAL,
Watertown, Mass., June 24, 1881.

Col. T. T. S. LAIDLEY, *Commanding:*

SIR: Agreeably to your request, I have designed two guns for manufacture by the South Boston Iron Company, and have the honor to submit herewith a report of their construction, inspection, and proof.

DESIGN.

When it is stated that these guns, with the exception of being two calibers shorter, are exact fac-similes, on a scale of four-tenths, the one of an 8-inch M. L. rifle, on the latest plan of conversion, and the other of an 8-inch cast-iron rifle of exactly the same exterior dimensions, but with a solid breech, and without a lining, any extended description of the two guns becomes unnecessary. I submit, however, on plate I, a drawing of these guns, with the principal dimensions marked thereon. They were made two calibers shorter than the Rodman model for reasons of convenience and economy.

CONSTRUCTION.

It was desired to have these guns identically of the same material as our 10-inch S. B. guns, now used for conversions, but no Richmond iron being on hand for the purpose, and the main consideration being to have the guns alike as to strength of material, a mixture was made of such available ores as was thought would fairly assimilate to the Richmond iron in its physical properties. After a few preliminary experiments, resulting in considerable delay, from a desire to accommodate the heats to other wants and ulterior purposes of the foundry, the furnace was charged, by Mr. Pearse, the manager, with the following mixture:

Kinds of iron.	Grade of iron.	Weight in pounds.
Dover	No. 5	3,500
Do	No. 3	2,500
Do	Nos. 2 and 1	1,500
Muirkirk	No. 4	2,500

With a view to securing as great a similarity as possible in the two guns, 1st. The metal was poured from a single ladle large enough to contain the metal for both guns; 2d. The flasks were placed side by side (breech of guns down) and the molds connected, by runners of equal length, with a common "pool"; 3d. The metal was poured into the pool, whence it was conducted to the two molds, filling them at the same time.

When the metal had remained in fusion about an hour and a half it appeared to be in proper condition for casting.

The molds marked 1 and 2, respectively, were filled in about forty seconds, but the riser of No. 1 being eleven inches shorter than that of No. 2, additional metal was poured in half an hour after casting. Had I been present at the time I should have prevented this error, which, while injuring the metal in the riser, fortunately in this case extended its effects but slightly beyond the face of the muzzle of the gun.

The following are the mechanical tests, reported from the foundry testing machine, of specimens taken from the risers, the centers or breaking parts of the specimens being about three inches from the face of the muzzle proper. The shorter riser, in gun No. 1, together with the disturbance of the cooling metal by the later filling of the mold, will probably account for the difference in density and strength recorded against that gun.

Gun No. 1.			Gun No. 2.		
Number of specimen.	Specific gravity.	Tenacity.	Number of specimen.	Specific gravity.	Tenacity.
1	7.2395	35,952	1	7.2672	36,199
2	7.2383	31,139	2	7.2878	34,134
3	7.2326	34,290	3	7.2683	36,370

The second specimen of gun No. 1 was from beside an "open" place in the riser. A specimen from the cascable of this gun was taken, giving a specific gravity of 7.2963 and a tensile strength of 33,599 pounds.

There is every probability that below a few inches from the muzzle the two guns are sensibly uniform and alike as to the qualities of the metal.

The fracture of this metal is rather fine-grained, the mottle is not distinct though the color is good. The metal appears to have fair resisting powers under the higher strains, but has too low a limit of elasticity for a first-class gun metal. The following table reveals some of its characteristics, and it is to be observed that the foundry reports given above would rather indicate a better result.

Table of extension, compression, and permanent set per inch of length caused by the undermentioned weights operating upon specimens 21 *inches and* 10 *inches, respectively, and* 1.383 *inches diameter.*

[Taken from near the exterior of a cylinder 16 inches diameter and 30 inches long, of a mixture of 3 parts of Dover to 1 part of Muirkirk.]

Weight per square inch applied.	Extension.	Set.	Compression.	Set.
Pounds.				
1,000	.00001	.....	.....	.....
2,000	.00006	.....	.....	.....
3,000	.00010	.....	.....	.....
4,000	.00016	.....	.....	.....
5,000	.00022	.00005	.....	.....
8,000	.00037	.00006	.00036	.00002
10,000	.00050	.00010	.00050	.00002
15,000	.00080	.00015	.00080	.00006
20,000	.00118	.00026	.00112	.00007
25,000	.00180	.00080	.00147	.00017
26,000	.00197	.00100	.00152	.00017
27,000	.00225	.00136	.00162	.00022
28,000	.00262	.00190	.00170	.00027
29,000	.00305	.00260	.00180	.00030
30,000	.00377	.00390	.00187	.00032
30,030	*	*	.....	.....
32,000	.....	.....	.00210	.00042
34,000	.....	.....	.00240	.00062
36,000	.....	.....	.00280	.00092
38,000	.....	.....	.00332	.00126

* Specimen broke.

The wrought-iron tube and jacket were furnished by Paulding, Kemble & Co., and appeared to be of excellent material and finish. They were inserted in the gun with a play of 0.002 inch, verified by careful measurement. The thread of the breech-screw was made 0.05 inch shallower than a proper scaling of the drawing would give, but as the thread was abundantly strong, and in some respects improved, I mention the circumstance as the only slight departure from a perfectly scaled model of the 8-inch converted muzzle-loading guns.

INSPECTION.

The guns were finished accurately to the prescribed dimensions, being identical as to length and maximum diameter, and varying in some of their other common measurements not more than one or two hundredths of an inch. The casting of gun No. 2 (lined) was entirely without a flaw, with the exception of a trifling sand-hole on the exterior, entirely removed in drilling a small hole similar to that used for a stay-pin in converted guns, but in this case only drilled in 1.25 inches instead of clear through to tube as in 8-inch guns. (The tube not being rifled.)

Gun No. 1 (solid) had a slight defect in the bore three and one-half inches from the muzzle, caused probably by the shortness of the riser and the disturbance of the metal already referred to.

Both guns were bored very true, the solid gun being one thousandth and the lined gun four thousandths of an inch under true size. The weight of gun No. 1 (solid) was 931 pounds, and that of gun No. 2 (lined) 955 pounds.

PROOF.

Arrangements were made for proving these guns to extremity by providing an ordinary sand-butt to hold the shot, a grooved slide made of heavy timbers for the guns to recoil in, and a brake or sliding buffer placed behind the gun and in contact with it at the moment of firing. It was designed to subject the guns to identically the same proof, and for reasons of economy to make the test so severe as to limit the endurance of the guns to a few rounds, and at the same time to eliminate any source of anomalous or unequal strains such as are due to the irregular action of bad projectiles, irregular loading, and kindred causes. It was also desired to localize the action of each charge specifically, and restrict its operation to such a length of bore as would bear the same ratio to the battering charge of 35 pounds employed in the 8-inch gun that the small guns themselves bore to the service weapon, namely, 4 to 10. To this end, 1st, the guns were not rifled, and a gas check being used, the gas was almost absolutely confined at each discharge; 2d, the charge was fixed at 2½ pounds of mortar-powder, making a cartridge 9 inches long; 3d, the projectiles were long cylinders or bolts of steel, with a windage of .03, and faced off squarely at each end, the front circular edge being slightly rounded.

The guns were discharged with the ordinary friction primer by means of a long lanyard.

RESULTS.

The results are given in the following tables of proof-firing and star-gauging. Briefly summed, these results are as follows:

Each gun was first fired with 2½ pounds of mortar-powder and steel projectile of 22 pounds, without a gas-check, recoiling seventeen feet upon the timbers inclined at an angle of five degrees. Each gun was then fired with the same charge and a steel projectile of 30¼ pounds, with a brass gas-check of $\frac{14}{16}$ pounds. The guns recoiled 27 feet, the entire length of the slide, against a timber abutment. The rear half of the recoil-way was then inclined at an angle of about 10° and a buffer-truck weighing 1,678 pounds placed against the guns, as has been described. The guns were then loaded with 2½ pounds of powder and *two* steel projectiles with a gas-check, making a projectile weight of 61 pounds, and filling the bore to within 3 or 4 inches of the muzzle.

The recoil of the buffer upon the discharge of the gun was 12½ feet, the gun coming to a rest in about its own length. Both guns were then washed out and star-gauged. Gun No. 1 (solid) showing an enlargement of 0.007 inch maximum, and gun No. 2 (lined) showing 0.021 inch maximum. An examination of the bores by sunlight revealed no change.

The projectiles having been recovered from the sand-butt (through which they had penetrated fifteen feet, and three feet, into hard ground) were carefully measured, showing no appreciable change, and the proof resumed. Both guns were again fired with the double shot, the recoil being the same as before. Gun No. 1 was next fired its fifth round, using the double projectile. The recoil was the same as before, and the maximum enlargement after this round was found to be 0.14 inch (see table), with no marks of deterioration in the bore. Gun No. 2 (lined)

was then fired its fifth round, with the same charge, and burst. The breech of the gun split into three parts, the larger section through the vent detaching itself from the right of the gun, opening a crack one-half an inch at breech, and just holding at front and uncovering one-half of the jacket and screw, the fraction extending somewhat more than half way to the muzzle.

The left of the gun was split a little further and opened one-half inch, and the tube being thus unsupported, except by the tops of the threads on one side, there remained (the tube not having opened widely) after rupture still sufficient power to drive the tube back about $1\frac{3}{4}$ inches. The powder chamber was enlarged over its original diameter 0.213 inch, and the gas leaked through circumferential fissures. Plate II will illustrate more specifically the nature of the rupture.

It was hoped that gun No. 1 might endure at least one more round with a double and single shot each, as means had been prepared for getting the powder pressure, and it was thought from the nature of the powder, the hermetical sealing of windage, and the great length of projectile, that they were violent. At its sixth discharge, however, loaded with a double projectile, the gun burst into 6 large and 3 minute fragments. The choke of the cartridge-bag (which should have been reversed for this occasion) clogged the piston so that the gauge which was in the base of the projectile did not operate satisfactorily. Two of the fragments struck the side logs with force to dent but not to break them, and the end of the trough in which the gun rested was splintered. The rupture is illustrated in Plate II.

Record of firing.

GUN No. 1 (SOLID).

Date.	Number of fire.	Powder.			Projectile.			Remarks.
		Kind.	Weight.	Length.	Kind.	Weight.	Length.	
			Lbs.	*Inches.*		*Lbs.*	*Inches.*	
June 14.....	1	Mortar	$2\frac{1}{2}$	9	1 steel	22	.....	No gas-check.
14.....	2	....do	$2\frac{1}{2}$	9	1 steel	$30\frac{1}{4}$	.....	Remaining r'ds
16.....	3	....do	$2\frac{1}{2}$	9	2 steel	$60\frac{1}{2}$	.....	with gas-check
17.....	4	....do	$2\frac{1}{2}$	9	2 steel	$60\frac{1}{2}$	.....	of $\frac{14}{16}$ pounds.
17.....	5	....do	$2\frac{1}{2}$	9	2 steel	$60\frac{1}{2}$	.....	
21.....	6	....do	$2\frac{1}{2}$	9	2 steel	$60\frac{1}{2}$	.....	Gun burst.

GUN No. 2 (LINED).

June 14	1	Mortar	$2\frac{1}{2}$	9	1 steel	22	.....	No gas-check.
14.....	2	....do	$2\frac{1}{2}$	9	1 steel	$30\frac{1}{4}$	.....	Remaining r'ds
16.....	3	....do	$2\frac{1}{2}$	9	2 steel	$60\frac{1}{2}$	.....	with gas-check
17.....	4	....do	$2\frac{1}{2}$	9	2 steel	$60\frac{1}{2}$	.....	of $\frac{14}{16}$ pounds.
17.....	5	....do	$2\frac{1}{2}$	9	2 steel	$60\frac{1}{2}$	.....	Gun burst.

Table of star-gauging of 3.20-*inch guns.*

Inches from muzzle.	Original.		Third round.		Fifth round.	
	No. 1.	No. 2.	No. 1.	No. 2.	No. 1.	No. 2.
38¾	−001	.....	+005	.....	.009	.105
38	− 1	.....	3	.....	9	.210
37½	− 1	−004	4	+013	9	.205
37	− 1	− 4	5	13	9	.205
36	− 1	− 4	5	13	10	.195
35	− 1	− 4	6	13	11	.182
34	− 1	− 4	6	14	12	175
33	− 1	− 4	6	17	14	163
32	0	− 4	5	15	10	150
31	0	− 4	4	14	8	133
30½	0	− 4	3	11	6	122
30	0	− 4	2	8	4	101
29	0	− 4	2	5	4	65
28	0	− 4	2	3	3	35
27	− 1	− 4	2	0	3	21
26	− 1	− 4	2	− 2	2	19
24	− 1	− 3	2	2	2	19
22	− 1	− 3	2	2	1	16
20	− 1	− 3	2	2	1	10
18	− 1	− 3	2	2	1	4
16	− 1	− 3	1	2	1	− 2
14	− 1	− 3	1	2	0	− 3
12	− 1	− 3	1	2	0	− 3
10	− 1	− 3	0	2	0	− 2
8	− 1	− 3	0	2	0	− 2
6	− 1	− 3	0	2	0	− 1
4	− 1	− 3	0	2	0	+ 1
2	− 1	− 3	0	2	0	0
1	− 1	− 3	0	2	0	0

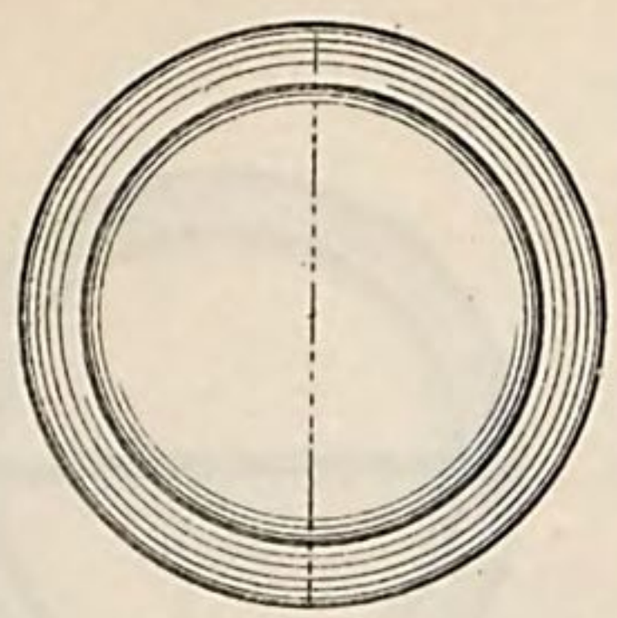
Besides the small Plates I and II, a full-size tracing is submitted which will answer for the exterior outlines and the bores of both guns, and which shows the position of the charge in rounds two (omitting the front projectile), and in rounds three, four, five, and six of the unlined gun with both steel bolts.

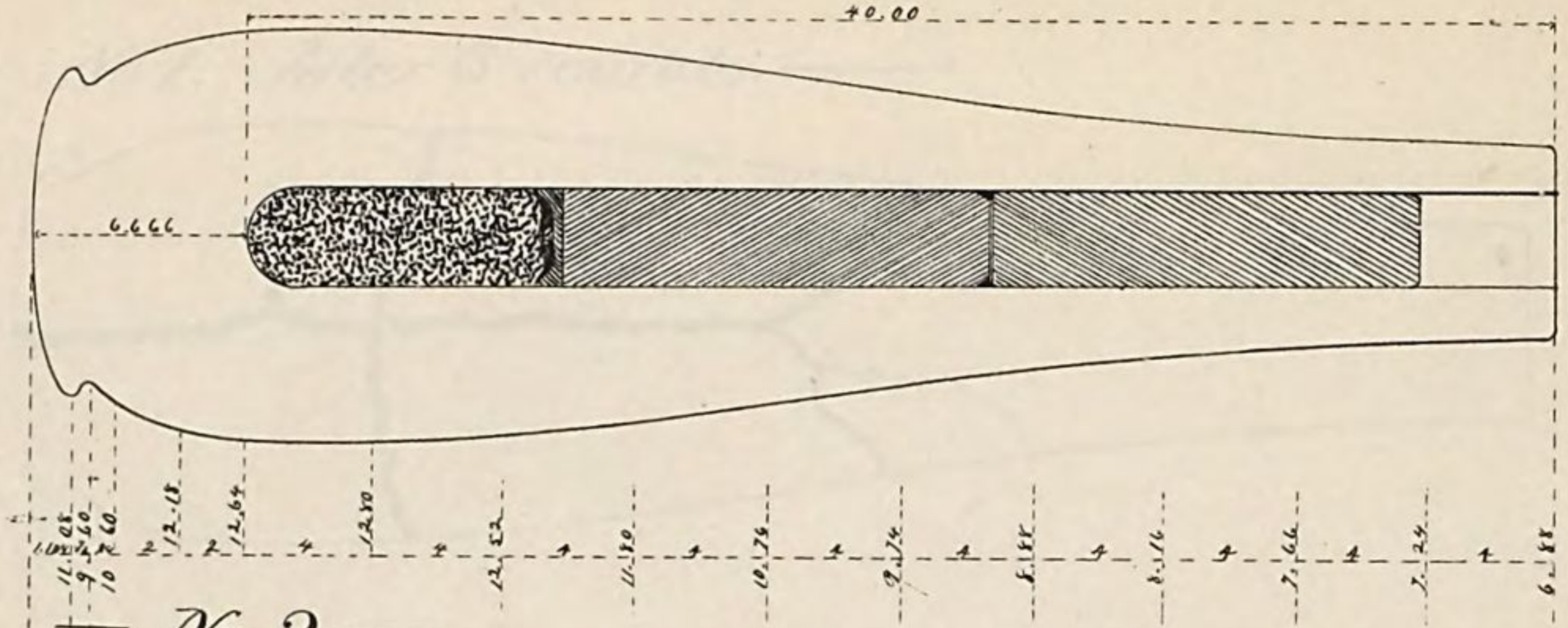
Very respectfully, your obedient servant,

JOHN G. BUTLER,
Captain of Ordnance.

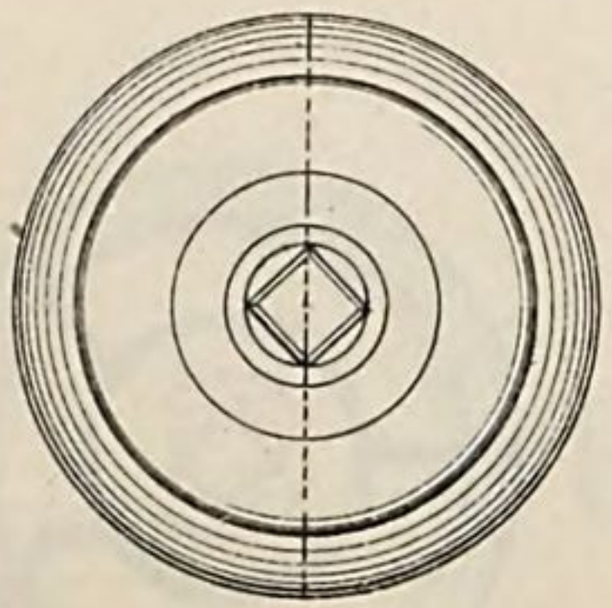
—Plate 1.—

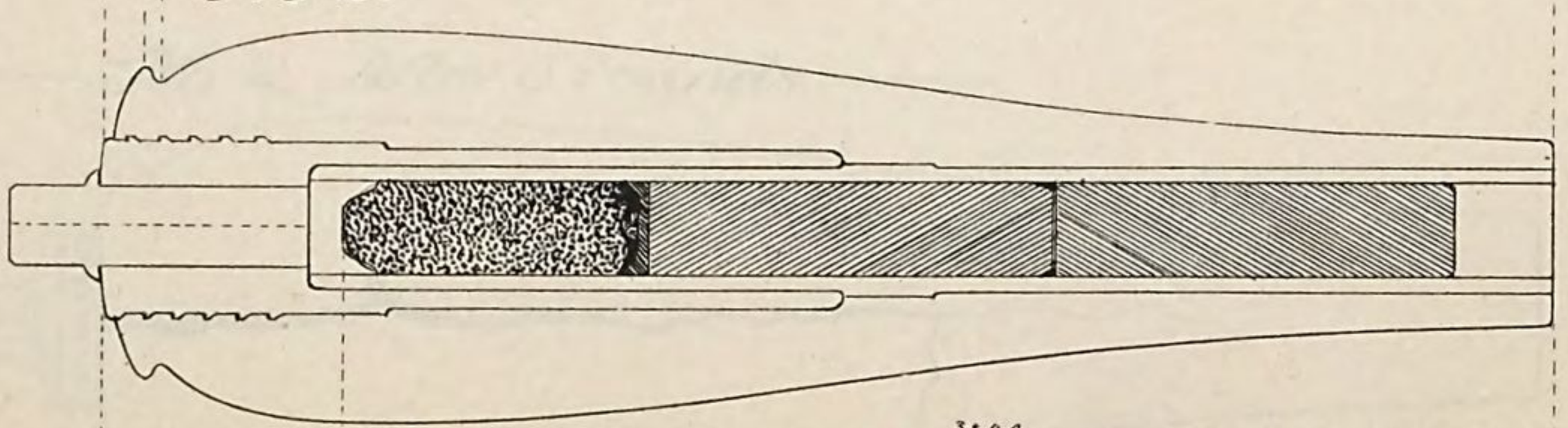
—No. 1.—





—No. 2.—

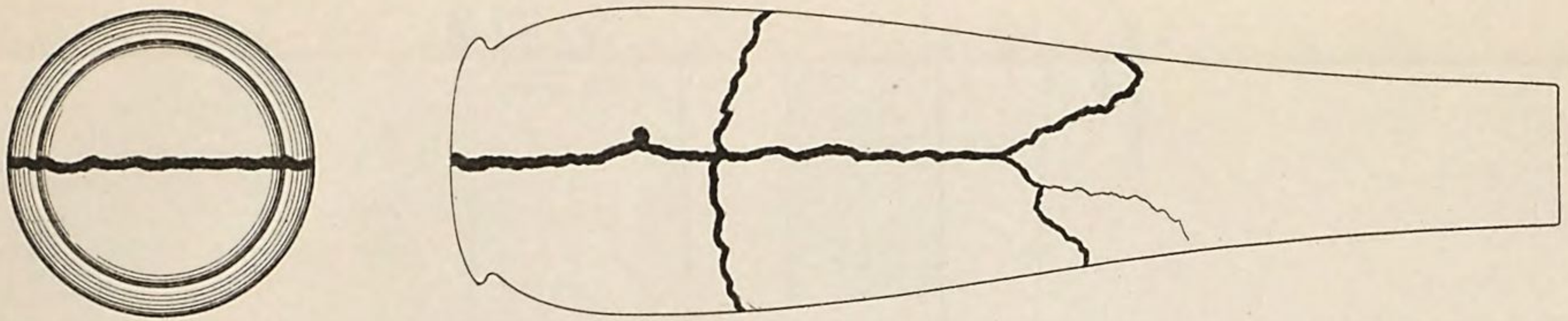




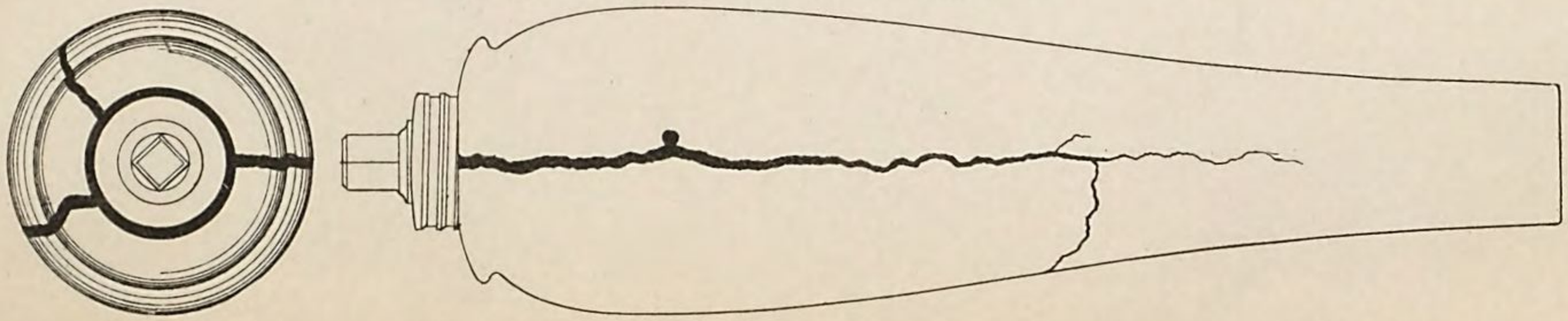
—Before Firing.—

SEN. EX. DOC. No. 178 pt 2 1st SESS., 47th CONG.

— No 1. After 6 rounds. —



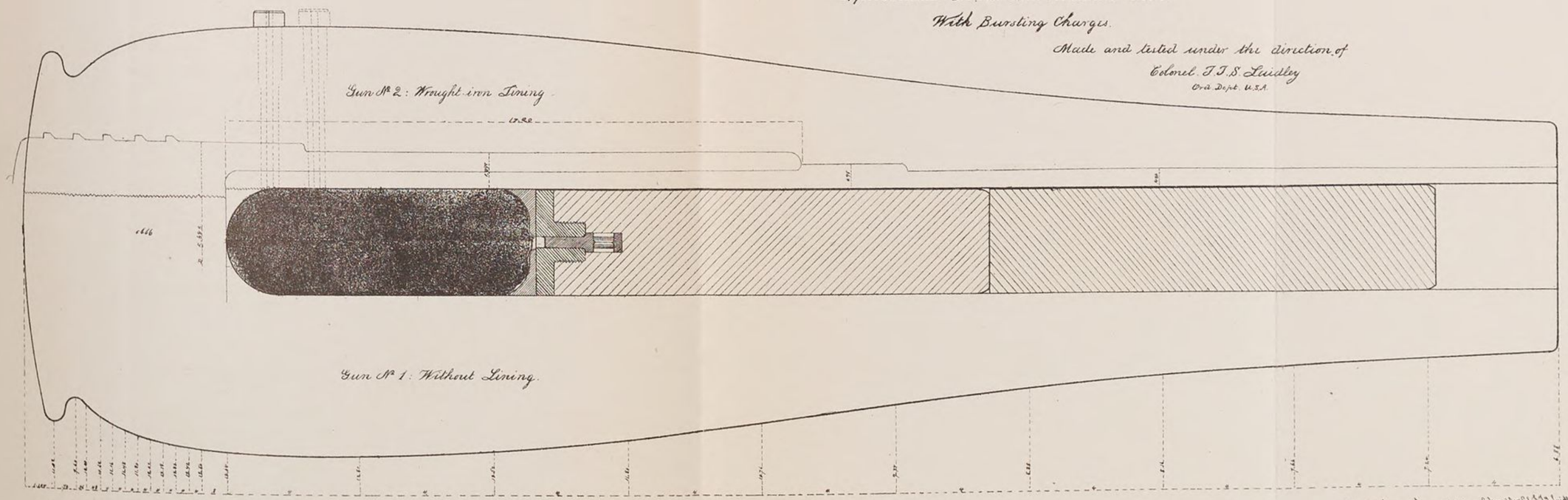
— No. 2. After 5 rounds. —



SEN. EX. DOC. No. 178 pt 2, 1st SESS., 47th CONG.

Plate III.

Experimental Lined and Unlined Guns
With Bursting Charges.
Made and tested under the direction of
Colonel T. J. S. Lindley
O. & Dept. U.S.A.



Washington Arsenal June 20th 1881 Approved C. J. S. Lindley
Brig. Gen. Chief of Ord.

SEN. EX. DOC. No. 178 pt. 2, 1st SESS., 47th CONG.

SUMMARY OF THE TESTS OF CONVERTED GUNS.

[Compiled from reports of the Chief of Ordnance, 1872 to 1880, inclusive, by Lieut. F. E. Hobbs, recorder.]

Gun.	Description of.	Date of fabrication.	No. of rounds.	Powder charge.		Projectile.		Velocity.	Pressure.	Energy.	Enlargements.	Remarks.
				Kind.	Weight.	Kind.	Weight.					
					Lbs.		*Lbs.*	*Ft.*	*Lbs.*	*Tons.*		
8-inch converted rifle, No. 1.	Converted from 10-inch Rodman cast-iron smooth-bore by lining with jacketed wrought-iron coiled tube inserted at muzzle.	1873–'74	776	Hexagonal..	35	76 Arrick, 621 Butler, 60 Dana, 19 experimental.	180	1. 411	31, 200	2, 444	@ 11 inches, .027 inch; @ 22 inches, .040 inch; @ 34 inches, .026 inch; @ 60 inches, .004 inch.	
9-inch converted rifle, No. 3.	Converted from 10-inch Rodman cast-iron smooth-bore by lining with jacketed wrought-iron coiled tube inserted at muzzle.	1873–'74	500	....do	40 & 45	83 Arrick, 300 Butler, 117 Dana.	225	1, 259	25, 500	3, 096	@ 11 inches, .033 inch; @ 22 inches, .034 inch; @ 32 inches, .018 inch; @ 63 inches, .004 inch.	
8-inch converted rifle, No. 2.	Converted from 10-inch Rodman cast-iron smooth-bore by lining with jacketed steel tube inserted from the breech.	1873–'74	456	....do	35	Butler	171	1, 419	29, 680	2, 491	@ 11 inches, .014 inch; @ 22 inches, .017 inch; @ 34 inches, .012 inch; @ 60 inches, .013 inch.	Steel tube cracked from 170th to 175th rounds—gun burst at 456th round.
										Lbs.		
8-inch converted rifle, No. 5.	Same as No. 1, with tube of American manufacture.	1875–'76	590	....do	35	61 Arrick, 418 Butler, 21 Dana.	180	1, 340	27, 019	4, 868, 125	@ 11 inches, .024 inch; @ 22 inches, .032 inch; @ 34 inches, .017 inch; @ 60 inches, .006 inch.	
9-inch experimental rifle, No. 4.	Converted by lining with jacketed steel tube inserted from the breech.	1876	116	....do	40	106 Butler, 10 Dana.	229	1, 343	25, 116	6, 955, 524	@ 15 inches, .004 inch; @ 25 inches, .003 inch; @ 35 inches, .003 inch; @ 60 inches, .003 inch.	
										Tons.		
8-inch converted rifle, No. 7.	Lined with jacketed wrought-iron coiled tube inserted at breech.	1877	709	.... do	35	Butler	181	1, 290	26, 500	1, 960	@ 60 inches, .004 inch; @ 54 inches, .003 inch; @ 52 inches, .002 inch; @ 36 inches, .001 inch.	
12¼-inch rifle	Cast-iron casing lined with English wrought-iron coiled welded tube inserted at muzzle.	1877	26	....do	100	Butler	650	1, 444	32, 625	9, 000	@ 14 inches, .001 inch; @ 26 inches, .002 inch; @ 38 inches, .000 inch; @ 50 inches, .001 inch.	

Summary of the tests of converted guns—Continued.

Gun.	Description of.	Date of fabrication.	No. of rounds.	Powder charge.		Projectile.		Velocity.	Pressure.	Energy.	Enlargements.	Remarks.
				Kind.	Weight.	Kind.	Weight.					
					Lbs.		*Lbs.*	*Ft.*	*Lbs.*	*Tons.*		
10-inch converted rifle, No. 1.	Wrought-iron lining-tube inserted at muzzle by plan No. 2.	1878	33	... do	60	Butler	400	1, 347	20, 500	5, 031	@ 8 inches, .003 inch; @ 10 inches, .002 inch; @ 14 inches, .004 inch; @ 18 inches, .003 inch; @ 24 inches, .002 inch; @ 44 inches, .005 inch.	
8-inch b. l. converted rifle.	By lining with a steel-jacketed, coiled, wrought-iron tube inserted from breech.	1878	34	....do	35	Butler	.....	.....	.....	.....	.....	Energies and pressures "normal."
11-inch converted rifle, No. 1.	Converted from 15-inch smooth-bore Rodman, lined with jacketed wrought-iron coiled tube inserted at breech.	1879	401	Hexagonal, I. H. A.	75	Butler	525	1, 275	32, 000	6, 000	@ 18 inches, 001 inch; @ 54 inches, .002 inch; @ 72 inches, .003 inch; @ 80 inches, .004 inch; @ 89 inches, .005 inch.	
8-inch b. l. converted rifle, No. 1.	Lined with steel-jacketed coiled wrought-iron tube inserted at rear.	1878	489	Hexagonal..	35	Butler	180	1, 351	25, 000	2, 369	@ 1 inch, .005 inch; @ 14 inches, .004 inch; @ 38 inches, .003 inch; @ 48 inches, .004 inch; @ 52 inches, .005 inch; @ 58 inches, .008 inch.	
8-inch experimental m. l. chambered converted rifle, No. 28.	Lined with jacketed wrought-iron coiled tube inserted from rear of breech.	1880	119	....do	55	Butler	180	1, 641	37, 809	3, 357	@ 1 inch, .004 inch; @ 2 inches, .005 inch; @ 6 inches, .004 inch; @ 18 inches, .005 inch; @ 24 inches, .006 inch; @ 32 inches, .008 inch; @ 36 inches, .007 inch.	

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O

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 179.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

A communication from the Secretary of the Interior, of the 24th instant, with accompanying papers, submitting the draft of a proposed clause for insertion in one of the pending appropriation bills, to provide for the payment of certain legal services rendered to the Cherokee Indians in North Carolina, in 1881 *amounting to* $150.

JUNE 6, 1882.—Read and referred to the Committee on Appropriations and ordered to be printed.

To the Senate and House of Representatives:

I transmit herewith a communication from the Secretary of the Interior, of the 24th instant, with accompanying papers, submitting the draft of a proposed clause for insertion in one of the pending appropriation bills, to provide for the payment of certain legal services rendered to the Cherokee Indians in North Carolina, in 1881, amounting to $150.

The subject is presented for the consideration of Congress.

CHESTER A. ARTHUR.

EXECUTIVE MANSION, *June* 5, 1882.

DEPARTMENT OF THE INTERIOR,
Washington, June 1, 1882.

SIR: I have the honor to submit herewith an estimate of appropriation in the sum of $150 for the payment to Judge I. L. Henry, of North Carolina, for services rendered to the North Carolina Cherokees in a suit instituted against them by the administrator of the estate of Thomas Tatham, deceased, in the superior court of Graham County, North Carolina, spring term 1881, wherein execution had issued against their lands.

A copy of the letter of the Commissioner of Indian Affairs, of the 21st ultimo, transmitting the papers to the department, is also inclosed with the correspondence noted therein; and, agreeably to the recommendation of the Commissioner, I respectfully request that the matter may be presented to Congress for the consideration and action of that body.

I have the honor to be, sir, very respectfully,

Your obedient servant,

H. M. TELLER,

Secretary.

The PRESIDENT.

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, April 21, 1882.

SIR: On the 18th of May, 1881, Mr. James W. Terrell, of Webster, Jackson County, N. C., wrote to this office that some forty years ago some of the Cherokee Indians, who were heirs of the reservees under the treaties of 1817 and 1819, employed Thomas C. Tatham to survey some of the reservations; that his fees, to the best of his recollection, amounted to some $300 or $400, and had never been paid; that Mr. Tatham died a year or so ago, and his administrator obtained judgment against the band for nearly as many thousands as the original debt amounted to of hundreds; that an execution had been issued and it was proposed to sell the lands of the Indians in Cherokee and Graham Counties, North Carolina, to satisfy the judgment; that the Indians were without money or the means to raise money, and that unless some one located there should be invested with power to afford them protection their rich domain of country would soon be gone.

Believing that a local attorney of character and ability to be indispensably necessary for the protection of these Indians, Hon. James L. Henry, of Asheville, N. C., ex-judge of the ninth judicial district, was favorably recommended on account of his high character and pre-eminent ability, and as being altogether unmixed with any previous Indian complications in that country. Accordingly, on the 24th of May, 1881, this office requested Judge Henry to interpose in behalf of the Indians and endeavor to stop the threatened sale of their lands, which was to have taken place on the 6th of June, 1881, under an execution alleged to have been issued. He was advised that there were no funds available to pay for any services that might be rendered in behalf of the Cherokee Indians of North Carolina, but that an estimate for an appropriation or recommendation for authority to pay for such services would be presented to Congress and its passage urged at the ensuing session.

This office had always held that if Mr. Tatham had a valid claim it was against individual Cherokees and not against the band, and it is a mystery how a judgment could be given against a *band* for work performed forty years previously for individual Indians, some of whom affirmed that they had paid Mr. Tatham for the survey of their preemption rights under said treaty. The claim, however, had passed to a judgment, and its satisfaction had to be stopped, and for that purpose it was proposed to employ Judge Henry to obtain a temporary injuction, restraining order, and supersedeas to be made perpetual, or dissolved on a hearing to be had on the 22d June, 1881.

Under date of June 24, 1881, a certified copy of the judgment rendered in the case of Tatham against the Eastern Band of Cherokee Indians in North Carolina was forwarded by Judge Henry, which is as follows:

In the superior court, Graham County, spring term, 1881.

POLLY TATHAM, ADM'X OF THOMAS TATHAM, deceased,
against
THE EASTERN BAND OF CHEROKEE INDIANS of North Carolina.

This cause coming on to be heard on the former restraining orders, affidavits filed, exhibits, proofs, and arguments of counsel, and being heard and considered by the court, it is now, on motion of defendants' counsel, J. L. Henry (the plaintiffs con-

senting thereto), considered and adjudged that the plaintiffs be perpetually enjoined from suing out and issuing execution on the judgment heretofore obtained in this action, to wit, at fall term, 1879.

R. T. BENNETT,
Judge Presiding.

This, Judge Henry says, finally disposes of the matter in said court under that decree, and for the services rendered in said case he presents a claim of $250.

From the foregoing judgment of perpetual restraint, and from the certificate of Mr. Henry (copy herewith) as to the merits of the claim, filed in this office February 20, 1882, by Hon. R. B. Vance, an arrangement appears to have been entered into by Mr. Henry whereby the temporary injunction was, by consent of plaintiffs' counsel, made perpetual in consideration that he would recommend the payment of the claims, and that he would make a statement before Congress as to the justness of the same.

For the amount and character of service rendered, I am of the opinion that Mr. Henry is not entitled to the sum claimed.

Taking this view of the case, I recommend that Congress be asked to appropriate the sum of $150 to pay James L. Henry, of Asheville, N. C., for services as attorney in behalf of the North Carolina Cherokees, to be paid out of any moneys in the Treasury of the United States not otherwise appropriated.

I submit herewith a draft of an item for such an appropriation to be added to the deficiency or sundry civil appropriation bill.

Very respectfully, your obedient servant,

H. PRICE,
Commissioner.

The Hon. SECRETARY OF THE INTERIOR.

For this amount, to pay James L. Henry, of Asheville, North Carolina, for services as attorney in behalf of the North Carolina Cherokee Indians, in the case of Polly Tatham, administratrix of Thomas C. Tatham, deceased, against the Eastern Band of Cherokee Indians of North Carolina, one hundred and fifty dollars, to be paid out of any moneys in the Treasury not otherwise appropriated.

GRAHAM COUNTY, NORTH CAROLINA,
In the Superior Court:

I certify that in the course of professional services, in the employment of the Commissioner of Indian Affairs, I have had occasion to examine the claim of Polly Tatham, administratrix of Thomas Tatham, deceased, for services rendered in surveying preemption claims, and I am satisfied that the services were rendered, and that Tatham has not been paid therefor, and, in my opinion, Congress ought to make a special appropriation for that purpose.

J. L. HENRY,
Attorney at Law.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 180.

LETTER

FROM

THE ATTORNEY-GENERAL,

TRANSMITTING

In response to Senate resolution of the 7th June, 1882, lists of the judgments or awards rendered against the United States, in what are called "the flowage cases" in Wisconsin, &c.

JUNE 12, 1882.—Referred to the Committee on Commerce and ordered to be printed.

DEPARTMENT OF JUSTICE,
Washington, June 9, 1882.

SIR: In response to the Senate's resolution of the 7th instant, I have the honor to transmit herewith lists of the judgments or awards rendered against the United States in what are called "the flowage cases" in Wisconsin, from which cases no appeal has been taken; and the names of the parties in whose favor the judgments were respectively recovered.

But I must decline, though with great reluctance, to advise, as requested by the Senate, upon the question whether these judgments should be paid, for the reason, which has been frequently stated by me and my predecessors, that there is no authority given by law to the Attorney-General to advise Congress or any committee or member thereof upon matters of legislation, except those immediately connected with the administration of this department.

There is, however, upon the files of the department, a letter from Hon. O. B. Thomas, the Assistant Attorney-General, a copy of which, as it contains information upon the subject inquired of, I inclose.

Very respectfully,

BENJAMIN HARRIS BREWSTER,
Attorney-General.

HON. DAVID DAVIS,
President of the Senate.

PRAIRIE DU CHIEN, WIS., *May* 31, 1882.

SIR: In reply to your letter of the 29th instant in relation to the payment of the awards for damages caused by the dams at Appleton and Montello, and your inquiry as to whether the payment of these awards will embarrass me in any position I have taken in defending against the flowage cases generally, I have the honor to state that I fear an appropriation by Congress to pay these awards will, unless a provision is made in the appropriation act guarding against such result, have the effect to entirely do away with one of the points raised in the case now pending in the United States

Supreme Court, and which applies to all these cases, and one which if decided in favor of the United States is a bar to any further proceedings in any of these cases in the State courts.

That this question may be fully presented to you, I take the liberty of making the following statement:

The law of this State in relation to acquiring land by right of eminent domain, by railroad companies, under which these proceedings were had in the State courts, in substance provides, that when the land has been taken without making compensation, the land owner may himself commence the proceedings, by petition to the court or a judge thereof, in which proceedings three commissioners are appointed to view the land and make an award; either party has thirty days from the date of filing the award to appeal to the circuit court of the county in which the land is situate, in which appeal the land owner is set down as plaintiff and the railroad company as defendant; on the trial the case must be tried before a jury unless both parties waive a jury.

The excessive awards and verdicts against the United States caused me to carefully examine the grounds upon which it was claimed the State courts had jurisdiction of these cases.

I found several serious objections to such jurisdiction. The first and only one that it appears to me can be affected by an act making provision for the payment of these claims is found in the act of Congress authorizing compensation to be ascertained.

The act of Congress approved March 3, 1875, entitled "An act to aid in the improvement of the Fox and Wisconsin Rivers in the State of Wisconsin" provides "that the amount of such compensation" (meaning the compensation for damages caused by the United States in flowing lands in making the improvements) "may be ascertained in the *mode* provided by the laws of the State where any such property lies."

This is the only part of the act upon which the State courts base their jurisdiction.

The point was made that this did not give the State courts jurisdiction.

It was contended that the words "mode provided by the laws of the State," used in the act of Congress, meant the rule of law by which the amount of such compensation should be ascertained, but did not designate the State court as the *forum;* that unless otherwise provided by an act of Congress the rights and remedies claimed under and by virtue of the laws of the United States must be enforced in the courts of the United States; that State courts, except in a few cases easily enumerated, were not required or authorized to administer the laws of the United States. Many cases were cited where by act of Congress the United States courts were required to be governed, in the matters referred to in such acts, by State laws, in their procedure; in other words, they were required to adopt the mode provided by the laws of the State.

It was contended that under the decision of the Supreme Court of the United States (Kohl *vs.* United States, 91 U. S., 372) the United States circuit court had jurisdiction of the subject-matter, and that all that the act provided was the mode or rule by which that court should be governed in the exercise of such jurisdiction.

If this point is well taken and Congress makes an appropriation for the payment of the awards or judgments made or rendered by the State tribunals, I fear such act will be construed as a legislative interpretation of the act of Congress approved March 3, 1875, and that thereby Congress would adopt and ratify the construction of said act contended for by the land-owners.

This it appears to me would be so, unless a provision was made in the appropriation act that it should not be thus construed.

Very respectfully,

O. B. THOMAS,
Special Assistant Attorney-General.

Hon. B. H. BREWSTER,
Attorney-General of the United States, Washington, D. C.

Statement of damages awarded against the United States for flowage caused by the dam at Appleton, Wis., where no appeal is pending.

Date of filing award.	Name of party in whose favor award was made.	Amount of claim as made by the land-owner.	Amount of award as allowed by the commissioners.
Feb. 27, 1878	Andrew Frederickson	$1,800 00	$905 00
27, 1878	Joseph Strobe	2,000 00	960 00
27, 1878	George Allanson	400 00	125 00
27, 1878	Patrick Hayes	1,000 00	265 00
27, 1878	William Sill	1,5 0 00	760 00
27, 1878	E. P. Sill and William Sill	1,500 00	430 00
27, 1878	J. A. Sandford	800 00	250 00
27, 1878	R. J. Rodick	400 00	135 00
27, 1878	Amos D. Page	1,200 00	760 00
27, 1878	Helen B. Chapman	2,500 00	940 00
27, 1878	Samuel Neff	1,300 00	455 00
27, 1878	Michael Clarey	900 00	230 00
27, 1878	Patrick Hussey	100 00	30 00
	Total awards	.....	6,245 00

Statement of damages awarded against the United States for flowage caused by the Montello Dam, Marquette County, Wis., where no appeal is pending.

Date of filing award.	Name of party in whose favor award was made.	Amount of claim as made by the land-owner.	Amount of award as allowed by the commissioners.
May 11, 1876	T. A. Pease	$800 00	$375 00
13, 1876	Henry N. Rockefeller	750 00	148 60
13, 1876	C. C. Matthews	625 00	332 25
13, 1876	John Mee, Richard Mee, F. A. Kendall	800 00	241 60
Aug. 2, 1876	T. A. Phœnix	1,400 00	314 50
2, 1876	Harriet B. Cramer	800 00	53 04
2, 1876	Isaac Pickering	375 00	118 66
4, 1876	Jane Pickering	500 00	107 27
21, 1876	F. B. Hans	1,300 00	430 35
21, 1876	A. N. & T. Whitson	1,000 00	290 70
21, 1876	L. R. Slade	1,300 00	126 99
21, 1876	Margaret Bremer, Frank Bremer, Theodore Bremer	4,500 00	392 30
21, 1876	Elizabeth Norris	500 00	65 00
21, 1876	Charles Metcalf	1,500 00	406 13
Oct. 18, 1876	Charles H. Kemply	7,000 00	505 25
17, 1877	John McNabb	1,200 00	334 35
17, 1877	John Rogers	800 00	338 38
17, 1877	Mary Ann Leach	600 00	150 40
17, 1877	J. H. Merritt	1,500 00	434 25
17, 1877	Eli McNutt, Hiram McNutt, and Angeline Waldo	3,800 00	902 60
17, 1877	Edward McCaffrey	1,000 00	253 20
18, 1877	Robert Page, Emma Gaylord, Lawrence B. Gaylord, and Spencer M. Gaylord.	400 00	183 54
18, 1877	William Horting	600 00	50 00
18, 1877	Robert Weir	900 00	626 70
18, 1877	Matthew Spain	700 00	50 00
	Total award	.....	7,231 26
July 26, 1876	Abraham Seaman	1,000 00	643 54

Statement of damages awarded against the United States for flowage in the county of Columbia, Wisconsin, where no appeal is pending.

Date of filing award.	Name of party in whose favor award was made.	Amount of claim as made by the land-owners.	Amount of award as allowed by the commissioners.
April 5, 1877	John Cushing	$500 00	$500 00
6, 1877	Dennis Cushing	500 00	370 00
6, 1877	William Cushing	700 00	290 00
28, 1877	Jumes Durick	1, 000 00	420 00
28, 1877	William Geary	600 00	280 00
30, 1877	Oliver Dempsey	600 00	200 00
30, 1877	Catharine Cavanaugh	400 00	300 00
Oct. 19, 1877	James Durick	500 00	100 00
19, 1877	W. M. Tindair	300 00	100 00
19, 1877	John T. Seymour	2, 000 00	200 00
	Total awards	.....	2, 560 00
	Aggregate	.....	16, 679 80

47TH CONGRESS } SENATE. { EX. DOC.
1st Session. } { No. 181.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING,

In response to Senate resolution of June 5, 1882, a report from the Secretary of State submitting copies of the full correspondence between that Department and the Hon. William Henry Trescot, special envoy extraordinary to the Republics of Peru, Chili, and Bolivia, and Walker Blaine, Third Assistant Secretary of State.

JUNE 14, 1882.—Read and referred to the Committee on Foreign Relations, and ordered to be printed.

To the Senate of the United States:

I transmit herewith, in response to the resolution of the Senate of the 5th instant, a report from the Secretary of State, submitting copies of the full correspondence between the Department of State and the Hon. William Henry Trescot, special envoy extraordinary to the Republics of Peru, Chili, and Bolivia, and Walker Blaine, Third Assistant Secretary of State.

CHESTER A. ARTHUR.

EXECUTIVE MANSION,
Washington, June 14, 1882.

To the President:

The Secretary of State, to whom was referred the resolution of the Senate of the United States of the 5th instant, requesting the President, if not in his judgment incompatible with the public interest, to transmit to the Senate copies of all correspondence, not heretofore communicated, between the Department of State and the Hon. William Henry Trescot, special envoy extraordinary to the Republics of Peru, Chili, and Bolivia, and Walker Blaine, Third Assistant Secretary of State, has the honor to lay before the President the full correspondence in response to that resolution.

FREDK. T. FRELINGHUYSEN.

DEPARTMENT OF STATE,
Washington, June 14, 1882.

COMMUNICATIONS FROM THE SECRETARY OF STATE TO MR. TRESCOT.

No. 1.

Mr. Blaine to Mr. Trescot.

[Telegram.]

TRESCOT,
Care American Consul, Panama:

Kilpatrick died last Sunday. President directs that Walker shall act as charge d'affaires until arrival of minister. Instructions mailed yesterday to Santiago. Proceed without delay on Lackawanna. If Alaska has not arrived it may be better not to go ashore at Callao. Telegraph before sailing.

BLAINE.

(Received at Panama, December 12, 1881.)

No. 2.

Mr. Blaine to Mr. Trescot.

[Telegram.]

TRESCOT,
Care American Consul, Panama:

Have you received my dispatches sent Sunday.

BLAINE.

(Received at Panama, December 13, 1882.)

No. 3.

Mr. Blaine to Mr. Trescot.

[Telegram.]

TRESCOT,
Care American Consul, Aspinwall:

Find dispatches at Panama.

BLAINE.

(Received at Panama, December 13, 1882, by mail from Aspinwall.)

No. 4.

[Telegram.]

Mr. Frelinghuysen to Mr. Trescot.

The telegrams sent on January 3 and January 4, 1882, by Mr. Frelinghuysen to Mr. Trescot have already been published. [See also Enclosures Nos. 4 and 5 in Mr. Trescot's dispatch No. 8.]

No. 5.

[Telegram.]

Mr. Frelinghuysen to Mr. Trescot.

On the 4th of February, 1882, Mr. Frelinghuysen instructed Mr. Trescot by telegram, received by the latter February 6th, that the United States only proposed to give counsel and aid to Chili in any negotiations which that country might desire to make; that Chili must herself determine whether or not she would accept such aid, but that in no event would the United States take part in negotiations based upon the surrender of Tarapacá, and a further indemnity of twenty millions, as such a demand is considered exorbitant. The opportunity had arrived for Chili to show herself just and magnanimous.

No. 6.

[Telegram.]

Mr. Frelinghuysen to Mr. Trescot.

On the 22d of February, 1882, Mr. Frelinghuysen instructed Mr. Trescot, by telegram received the same day, that the President had been hoping to hear further from Mr. Trescot; that the United States would assent to a liberal war indemnity, but that consent was not to be given to the cession of Tarapacá without first communicating with the Department; that should Chili persist in her demand for such cession, the creditors of Peru might possibly maintain that the revenue of Tarapacá had been already hypothecated, and that the President desired to urge moderation on the part of Chili.

No. 7.

[Telegram.]

Mr. Frelinghuysen to Mr. Trescot.

On the 1st of March, 1882, the Secretary of State telegraphed Mr. Trescot that the President preferred that for the present himself and Mr. Blaine should remain and report the situation; that a communication of the condition of affairs had been made to Congress, and that the President desired that no opportunity should be lost to carry out his views as indicated.

No. 8.

[Telegram.]

Mr. Frelinghuysen to Mr. Trescot.

On the 16th of March, 1882, Mr. Frelinghuysen telegraphed Mr. Trescot (received March 17) that his suggestion was approved and that the archives of the legation might be left in charge of the consul at Valparaiso.

No. 9.

Mr. Frelinghuysen to Mr. Trescot.

No. 8.] DEPARTMENT OF STATE,
Washington, March 18, 1882.

SIR: I inclose for your information a copy of a dispatch (No. 337) of the 25th October last from our minister at Buenos Ayres, and a copy of a memorandum which accompanied the same, of action taken by the Argentine Government, in the latter part of 1880 and thereafter, in the direction of a friendly mediation between the belligerent governments on the west coast of South America by states which, in consequence of their geographical position, would be able to tender the same with as little delay as possible.

I am, &c.,

FRED'K T. FRELINGHUYSEN.

[Inclosure 1 to No. 8.]

Mr. Osborn to Mr. Blaine.

No. 337.] LEGATION OF THE UNITED STATES,
BUENOS AYRES, *October* 25, 1881. (Received November 29.)

SIR: In an interview with Dr. Irigoyen, minister for foreign affairs, at his residence, on the 1st instant, he read to me from a copy of a memorandum just received from a personal friend in Peru, addressed by General Hurlbut, our minister at Lima, to Admiral Lynch, commanding the Chilian forces in Peru, and at the same time he informed me that he had, in November last, addressed a dispatch to the court of Brazil, indicating the same policy to be pursued as that foreshadowed by Hurlbut's memorandum, copies of which dispatch were sent to the Argentine representatives at Washington and London, to be laid before those two governments.

The minister now informs me that a reply has just been received from Lord Granville, approving of the suggestions made or policy indicated, and, as the Argentine representative did not leave a copy with the Hon. Secretary of State, he has furnished me with a memorandum referring to the matter, and also with an official translation of the same, which I have the honor to inclose herewith.

I have, &c.,

THOS. O. OSBORN.

[Translation.]

MEMORANDUM.

A dispatch was sent by this department under date of November 9, 1880, to the Argentine minister to Brazil signifying to him that after the unexpected outcome of the noble mediation offered to the belligerents of the Pacific by the United States Government, it deemed it expedient to renew a friendly mediation to be carried out by such states as should, on account of their geographical position, be able to tender it with as little delay as possible. In accordance with these views the minister was directed to bring the matter to the knowledge of the Brazilian Government.

An indication was likewise made that, should the suggestion be met by the approval of said government, this one was of opinion that the Cabinet at Washington ought to be made acquainted with this initiatory step in case that Cabinet should be inclined to repeat the tender of good offices so nobly proffered on the former occasion.

These instructions were amplified by a dispatch under date of the 10th of the same month, in which the Argentine minister was informed that the President desired that at the conference the minister was to propose and base on the previous dispatch, he was to prudently enter into considerations on the conduct observed by the allied governments in the Paraguayan war, a war in which said governments did not think that they were, as victors, entitled to exact any cession of territory.

He was reminded at the same time that it was advisable that he, in his conversation with the Brazilian foreign secretary, should lay stress on the fact that this government

has no further interest beyond the achievement of peace; inasmuch as the upshot of the campaign will in no wise influence the solution of the boundary question.

The Argentine minister to Brazil acknowledged the receipt of these dispatches and in pursuance thereof, had an interview with the foreign secretary at which the latter manifested his desire to be made acquainted with the opinion of the Argentine Government as to the *modus operandi* and manner of making the mediation an efficient one. He added that he likewise, for his part, accepted the idea of bringing this to the knowledge of the United States Government.

Some time after, on December 14, this department communicated to the Argentine minister to Brazil that the President would view with satisfaction the acceptation by the Brazilian Government of the proposals he had made, and we counseled the suggesting to the foreign secretary the advisability of a spontaneous procedure on our part, without waiting for any indication from the interested governments. At the same time we authorized said minister to come to an agreement as to the manner of making the mediation an efficient one.

The Argentime minister confirmed the statements of his previous dispatch as regards the acceptance of the idea of mediation by the Brazilian Government, adding that he believes that the government has but little faith in the matter, on account of the advanced stage of the war. He also stated that he had had an interview with the foreign secretary, whom he asked if his government was disposed to admit the joint mediation establishing the following principles as appertaining to American international law: to mitigate the horrors of war, and not to exercise the right of conquest?

The Brazilian minister objected to make these declarations on the ground that they might prove a difficulty in the way of the mediation.

The dispatch winds up by saying that he is satisfied that the imperial government is only disposed to tender an officious mediation on the condition that it be asked for by the interested parties.

On December 18, this department forwarded to the Argentine minister to Brazil the bases on which it considered the mediation ought to be offered. They are as follows:

I.

This government is of opinion that after appointing their extraordinary representatives, these ought to offer the Chilian Government the joint mediation, and that the offer should be also made to the allies, setting forth the friendly motives that give rise to this act of sincere cordiality, and signifying their readiness to favor by every means consonant with their duty, and with the impartial policy of their governments the possibility of the belligerents being able to bring about by just and equitable settlements the end of the war that is dividing them.

If, as is probable, the joint mediation is accepted, the opportunity would have arrived for mediating ministers to enter upon their mission, encouraging a meeting of plenipotentiaries of the belligerents on board of some man-of-war of the imperial navy, or, in defect of this, on some other neutral one.

The meeting brought about, the mediating minister might open and preside over the conference, whereat they would solicit proposals for peace, and have them discussed; in this they will use every effort to bring about the result that is so vehemently desired.

They will favor by their friendly wishes every proposition that shall be conducive to the end aimed at, the re-establishment of peace. But they are on no account to abet any such as may tend to segregate territory or to lower the rights that any of the three belligerents may have as sovereign owner.

On the contrary, should any such propositions be advanced (and, as it is natural, rejected) by any of the belligerents, the mediators are bound to use their discreet and friendly efforts toward their being substituted by others that do not imply destruction of sovereign rights nor territorial anne xation.

Besides this kind of proposals, they are to contribute with all the prudence the question calls for to the acceptance of such as may be submitted as conducive to bringing abont peace.

The Chilian Government in its circular dispatch to foreign governments solemnly declares that it only aims at guarantees of peace for the future, and indemnification for damages and expenses incurred.

After setting forth in these words the pretensions of the Chilian Government, the mediators can base their good offices on that exposé, and their efforts are to aim at the guaranteeing of peace by suitable associations of circumstances, without at all affecting the sovereign rights and territorial integrity of the belligerents.

As regards the payment of indemnifications and the manner of efficiently carrying them out, the mediators will employ all such means as may be suggested to them by their ability, to arrive at an agreement as to said demands which cannot be the cause of a desolating war.

II.

Should the belligerent governments, or any of them, refuse to attend by means of plenipotentiaries any further conferences, the mediators will ask for such bases or propositions as might be conducive to a solution, and these they will submit to the other belligerent, and thus continue negotiations.

The ministers should follow the same preceding rules, that is to say, they will decline to be the channel for exactions of territorial cessions which would be tantamount to conquest. Should any such propositions be brought forward they are to be forthwith substituted by others calculated to bring about the lasting peace that is aimed at.

In the event of some one of the belligerents unfortunately insisting on maintaining said propositions of annexation as essential, and should refuse to substitute them, the mediators will declare that they are not able to submit them and that they prefer bringing their mission to an end.

III.

If, as is not probable, the mediation should not be admitted by some of the belligerents, the mediators will signify that their governments believe the duty fulfilled which had been imposed upon them by the reigning spirit of humanity in this century and by that of fraternity which ever characterized the relations between the states of America. That they deeply regret the obstacles they have met with and which they submit to the consideration of their governments and to that of impartial nations who will judge alike of the difficulties and of the responsibility they carry with them.

IV.

Should the belligerents definitely refuse (which would not seem to be possible) to put forward propositions that may be made use of as a basis for discussion, the mediators might for their part tender some such as the following:

Joint payment to Chili by Peru and Bolivia of the expenses of the war, the amount of which would be fixed by joint commissions.

Restoration of goods and lands taken from private individuals.

Indemnification for damages caused.

Guarantees for peace and the payment of amounts due.

Submission to the arbitration of some impartial power of all preceding questions, and of all such as may arise in connection with such treaties as may be stipulated.

On January 17, the Argentine minister communicated to this department that, according to what had been signified to him by the managing director at the foreign office, no answer had up to then been given to his dispatch of December 25, as the minister had intended to tender his resignation, but that, as the circumstances no longer existed, it would be answered as soon as possible.

On the 9th of April, the Argentine minister sent a dispatch to the Brazilian department for foreign affairs, and informed it, that this government had directed him to renew the proposition to mediate between the belligerents and that the basis previously indicated as the same that the Argentine Government again submits.

Later on, under date of July 17, the Argentine minister gave notice, that he had received a communication from the foreign secretary, in which the latter declared that, some short time before his receipt of the note of April 9, the news had come from London that the French, English, and Italian Governments, at the request of that of Peru, were about to use their good offices for the re-establishment of peace.

This was borne out by the answer given in the House of Lords to a question put to the government by Sir Charles Dilke, under secretary of state for foreign affairs.

The Brazilian foreign secretary added that a complication was rising. The mediation proposed by the Argentine Government had to be offered to the three belligerents and would be met by that of the three European powers asked for by one of the allies, as it would seem, without the assent of the other.

The imperial government was obliged to await information to throw a light on the procedure of the three powers referred to.

It now knows that they have already given instructions to their diplomatic agents in the west coast, and that they would recognize the authority of Garcia Calderon, as soon as ever they became convinced that the Chilian Government was in treaty with him.

In view of this state of affairs, the imperial government proposes, in answer to the suggestion of mediation of a joint nature made by the Argentine minister, a tender of good offices without indicating the conditions of peace, and this offer will be made either to Chili and Bolivia alone, if Peru had accepted European intervention, or to all of the three, in case that intervention had not been accepted.

On August 28, this department addressed the Argentine minister and manifested that this government was disposed to tend, with that of Brazil, toward the acceptance of the good offices to which the dispatch of the 15th refers.

He was authorized to agree to the form to be adopted for the opening steps, and was empowered to accept the indications contained in the dispatch of the 15th.

He is recommended to draw, as far as possible, the basis together as submitted for the good offices, previously tendered for the joint mediation, but should this not be possible, he may accept the starting-point proposed by Mr. de Souza.

In August (31st), 1881, the Argentine minister informs the department that Mr. Caballero, the Bolivian minister to Brazil, had signified to him that the Bolivian government not only accepts the offer of good offices in its own name, but in that of the dictator of Peru.

BUENOS AYRES,
Foreign Office, September 8.

A true translation from the original in this deparment.

C. A. SHOOLBRED.

OCTOBER 22, 1881.

No. 10.

Mr. Frelinghuysen to Mr. Trescot.

[Telegram.]

On the 18th of April, 1882, Mr. Frelinghuysen informed Mr. Trescot that his last telegram could not be interpreted, and requested repetition thereof.

(Received in Lima, April 29, 1882.)

No. 11.

Mr. Frelinghuysen to Mr. Trescot.

[Telegram.]

On the 27th of April, 1882, Mr. Frelinghuysen telegraphed Mr. Trescot that it was intended by the former cable of March 16 to give permission to return to himself and Mr. Blaine, and that they might return at their own convenience.

(This telegram was received in Lima on May 6, 1882.

COMMUNICATIONS FROM MR. TRESCOT TO THE SECRETARY OF STATE.

No. 12.

Mr. Trescot to Mr. Blaine.

[Telegram.]

SPECIAL MISSION,
Panama, December 12, 1881.

BLAINE, *Washington:*

The mail brings no instructions for minister to Chili and minister to Peru. Have you sent them and peace invitations?

TRESCOT.

No. 13.

Mr. Trescot to Mr. J. G. Blaine

No 1.] SPECIAL MISSION OF THE UNITED STATES,
Panama, United States of Colombia,
December 12, 1881. (Received December 27.)

Hon. JAMES G. BLAINE, *&c., &c., &c.:*

SIR: I have the honor to inform you of our arrival at this place. Leaving Aspinwall yesterday by special train, we reached Panama in the afternoon, and went at once on board of the Lackawanna, which will be ready to go to sea to-morrow morning.

It is scarcely necessary, but it only seems proper to say that we were received by Captain Wilson with cordiality, and every possible preparation has been made for our comfort.

There is of course no information of interest in connection with the objects of the mission to communicate from this point. The rumors of occurrences in Peru are almost as vague and contradictory here as at home, and all that we have heard goes to show a continued condition of uncertainty as to whether there is any government in Peru.

I inclose the latest issue of the Daily Star and Herald, containing the proclamation of what would seem to be a sort of provincial dictatorship by General Carcers, and both in Spanish and in English a communication by Mr. Hurlbut to the notables of Lima, whoever they may be. All accounts seem to agree that Pierola has abandoned his claims to executive power, and the last report is that he has left the country.

I beg to call to your attention that the mail contained no communication either to General Hurlbut, General Kilpatrick, or Mr. Adams, instructing them as to the purpose or authority of the special mission. For reasons which are obvious I do not desire to submit to them my own instructions, and there may be some embarrassment should they, in the absence of instructions, decline to recognize the transfer of the negotiations to the special mission.

I know that such instructions were prepared, and I am confident that they were signed and ready for transmission. If they have been intentionally withheld I feel very sure that I would have been so informed, and I hope that you will agree in the conclusion to which I have come, that it is my duty to act as if they had been sent, and, if necessary, to furnish these gentlemen with copies of such portions of my own instructions as specify the duties and the extent of the authority confided to me.

Referring also to your verbal instructions, that I should take charge of the invitations to the Governments of Chili, Peru, and Bolivia to be represented at the proposed congress in Washington, and deliver them to the respective governments at such time as the circumstances of the anticipated negotiation seemed to render most opportune, I beg to inform you that the mail contains no such communications, and it will occur to you without suggestion from me that if at some later date these invitations are transmitted to the ministers at Lima, Santiago, and La Paz they should be instructed not to present them without my knowledge and approval.

Their delivery might, under circumstances by no means improbable, cause very serious embarrassment in the conduct of the special mission with which I have been charged. A reference to my instructions will, I think, sufficiently explain my meaning.

I consider this so important that I have deemed it proper to telegraph you the fact that these instructions have not been sent, in order that by the next mail I may know whether they have been intentionally kept back, or that, in case of accidental omission, they may be supplied.

I have the honor, &c.,

WM. HENRY TRESCOT.

No. 14.

Mr. Trescot to Mr. Blaine.

[Telegram.]

SPECIAL MISSION,
Panama, December 13, 1881.

BLAINE, *Washington:*

Telegrams received. Leave to-day. Callao eight days.

TRESCOT.

No. 15.

Mr. Trescot to Mr. Frelinghuysen.

No. 2.] SPECIAL MISSION, UNITED STATES,
January 13, 1882. (Received Feb. 14, 1882.)

SIR: I have the honor to inform you that I reached this capital on Saturday, 7th January. On Monday I informed Señor Balmaceda, the secretary for foreign affairs, of my arrival, and was received in public audience by the President at 1 o'clock.

I inclose the brief speech which I made on presenting my credentials, and the reply of his excellency the President. They will satisfy you that you need feel no apprehension of any such issue as you suggested in your telegram, which was received by me the day of my arrival at Valparaiso.

As the mail closes at 6 o'clock, I am compelled to be very brief, when the condition of affairs really requires a very full explanation.

Postponing to next mail a careful appreciation of the very delicate and difficult character of the question with which it has been made my duty to deal, I can only say now that I found here a state of feeling excited far beyond anything that I had anticipated. The popular impression was that I was the bearer of a positive and imperious demand from the United States that Chili should make an immediate peace upon such terms as my government deemed just and proper. And while the Government of Chili did not share in this exaggerated apprehension, there evidently existed in official circles an uneasy uncertainty as to the purpose of the special mission.

I have reason to believe that the remarks which I made at the reception this morning have relieved all apprehension of this sort.

I am afraid that it will be more difficult to correct the extravagant hope which exists in Peru of a prompt, and even forcible, intervention of the United States to secure a peace without cession of Peruvian territory.

The opinion which I think I am justified in forming even at so early a period is that Chili really desires peace on what is believed to be fair and necessary conditions, and that the government would gladly find a solution which would relieve it from a prolonged occupation of Peru. But how far I will be able to suggest a method which will conciliate rival interests and susceptibilities I cannot now say. Chili needs peace, but the destruction of the Calderon government and the arrest of Calderon himself have so disorganized Peru that there is no government with which Chili can treat.

I am satisfied that the more friendly are our relations with Chili the greater will be our opportunity and ability to serve Peru. And I can very well conceive that the present perplexed condition of the relations between the two countries may render the friendly intervention of the United States desirable to both.

After my reception this morning, I told Señor Balmaceda, the secretary for foreign affairs, that if he would accept a suggestion I would propose that, before opening any formal diplomatic correspondence, we should meet informally and have a full and amicable conversation. As I had reason to anticipate, he accepted the suggestion cordially, and I am to meet him at his department on Monday at 12 o'clock.

I inclose also a correspondence between Señor Balmaceda and myself, which will explain itself.

The matter was perhaps not very important, but under existing circumstances there might have been an intention which it was my duty to notice, and I trust that my action will meet your approval.

I ought, perhaps, to add that my reception here, both public and private, has been courteous and cordial.

As the administration removes from this place for the summer to Valparaiso and the adjoining watering-place of Viña del Mar, I will, of course, be obliged to transfer my residence there when they move, which they will probably do some time next week. I have inferred from the telegram received at Panama, informing me of Mr. Blaine's appointment as chargé d'affaires at Santiago, that it was not the intention of the department to modify its original instructions, and that I would be still authorized, in case of necessity, to charge him with instructions to Lima or La Paz.

I have, &c.,

WM. HENRY TRESCOT.

[Inclosure No. 1 in No. 2.]

Address of Mr. Trescot to the President of Chili.

Mr. PRESIDENT: I have the honor to present you my credentials as special envoy extraordinary and minister plenipotentiary from the President of the United States.

The frank and friendly communication with which I am charged will find, I am sure, a ready response at your hands. If recent occurrences have seemed to disturb that loyal confidence which has hitherto marked the relations of the two Governments, the President is persuaded that they are due to some unfortunate misunderstanding which need only be clearly stated in order to be satisfactorily corrected. The Government of Chili will not fail to appreciate the natural and deep interest which is felt by the United States in the prompt and honorable termination of a war between kindred republics; and I trust that your excellency will also feel assured that in no effort which the Government of the United States may desire to make towards so happy a consummation could there exist an intention to suggest any solution which would compromise the honor, endanger the true interest, or wound the susceptibilities of either of the belligerents.

I venture to hope that when I am permitted to lay before your excellency the views of the President you will find only an earnest desire for the arrival of that time when the powers now at war will resume their peaceful and prosperous progress; when strengthening themselves they will strengthen each other for the preservation of that system of free, strong, and independent republics which, founded in the traditions of the past, is the glory of the present and the security of the future in both Americas.

[Inclosure No. 2 in No. 2.—Translation.]

Reply of the President of Chili to Mr. Trescot.

Mr. MINISTER: I receive the credentials which you place in my hands with satisfaction, which accredit you as the special envoy extraordinary and minister plenipotentiary of the United States.

You may be assured that in the Chilian Government you will find a sincere and friendly welcome, which will be a merited reply to the loyalty of purpose and sentiments with which personally, and in obedience to your instructions, you come animated.

I am fully confident that our friendly relations with the United States, cultivated by both sides with the constant attention that is becoming to two honorable governments, will be maintained unchanged.

I esteem as a special proof of the sympathy of the Government of the United States, the natural interest that it manifests for the termination of a war which, unprovoked by Chili, has been brought to a final end by means of vigorous measures, and it is pleasing to me to hear from you that any effort made by the President of the United States for such a purpose, would never involve an intention to suggest any solution that might compromise or endanger the interests, the honor, or the susceptibilities of the belligerents.

Chili, an industrious people, that owes its welfare and its progress to peace, and which, beneath its shade, has secured and developed the democratic principles that constitute the immovable basis of the republic, and assure it in the future, could not accept, after the war, a peace that did not comport with its honor or fully secure its rights.

I do not doubt but that your mission will fully correspond with the elevated views of the President of the United States. It is also to be expected, on account of your abilities, as well as of your honorable antecedents. You will meet from this government every facility desirable, and I do not doubt but that you will find a cordial and pleasant welcome from Chilian society.

[Inclosure No. 3 in No. 2.]

Mr. Trescot to Señor Balmaceda.

GRAN HOTEL YUGLES,
Santiago de Chili, January 12, 1882.

SIR: I have the honor to acknowledge the receipt of your note of the 11th instant, informing me that his excellency the President of the Republic of Chili has been pleased to appoint Friday, 13th of the present month, at one o'clock p. m., as the time of my public audience for the purpose of presenting the letters of credence of which I am the bearer.

While thanking your excellency for this communication, I beg that you will allow me to call your attention to an error in my official address, which I am satisfied is only a clerical oversight, but which my government would, I am sure, expect me to have corrected.

I am styled both in the superscription of the official envelope and in the address of the note itself, "Enviado Extraordinarie Especial y Ministro Plenipotentiario de los Estados de Norte America."

The style and title of the United States are "The United States of America."

Your excellency's familiarity with diplomatic usage will, I am sure, lead you to appreciate the propriety of the correction which I have the honor to ask.

Renewing the assurance of my highest consideration,

I am your excellency's obedient servant,

WM. HENRY TRESCOT.

[Inclosure No. 4 in No. 2.]

Reply of Señor Balmaceda to Mr. Trescot.

REPUBLIC OF CHILI,
OFFICE OF THE MINISTER OF FOREIGN AFFAIRS AND COLONIZATION,
Santiago, January 12, 1882.

SIR: I have just received a note which your excellency did me the honor to address me of this date, for the purpose of asking me to change the address on communications that may be sent to you, by placing "The United States of America" in place of the United States of North America.

The official address which your excellency has seen on the dispatches which I have had the pleasure of sending to you is the same as has always been used by this office in its communications to the legation of the United States. However, I hasten to make a note of your remarks, which shall be attended to in future.

I take advantage of this occasion to reiterate to your excellency the expression of my sentiments of high consideration, with which I remain your excellency's attentive and true servant,

BALMACEDA.

No. 16.

Mr. Trescot to Mr. Frelinghuysen.

[Telegram.]

SPECIAL MISSION,
Santiago, January 23, 1882.

FRELINGHUYSEN, *Washington:*

After several confidential interviews, Chilian minister for foreign affairs disclaims offending by the removal of Calderon. Will accept good offices, and will facilitate conference between the provisional government of Peru and myself, with the exception of Calderon. Peace on the following conditions: Absolute cession of Tarapacá; and further, an indemnity of twenty millions, payable in ten years; to occupy Arica positively ten years; the indemnity unpaid, cession to Chili; appropriation of guano at Lobos; Peru refusing no further interference by the Government of the United States.

To offer good offices on the conditions named not according to instructions.

I have to suggest, send instructions. Do not interfere on the conditions named. You may recognize the necessity of ceding Tarapacá; if that modification cannot be obtained, carry out your instruction numbered two.

TRESCOT.

No. 17.

Mr. Trescot to Mr. Frelinghuysen.

[Telegram.]

SPECIAL MISSION,
Santiago, January 25, 1882.

FRELINGHUYSEN, *Washington:*

Chilian minister for foreign affairs desires Kilpatrick's dispatches and instructions should not be published. Our next mail explains.

TRESCOT.

No. 18.

Mr. Trescot to Mr. Frelinghuysen.

No. 5.]

SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Viña del Mar, Chili, January 27, 1882. (Rec'd March 7, 1882.)

SIR: In my last dispatch I informed you that the time for a confidential conference with the Chilian secretary for foreign affairs had been appointed. Since then I have had three conferences with Mr. Balmaceda, in which, with entire frankness, we reviewed the existing condition of our relations in reference to a possible settlement of the terms of peace between Chili and Peru and Bolivia. The result of these conferences I telegraphed you on Monday last, January 23, and I did so not only because instructions were necessary, but because the secretary distinctly informed me that certain contemplated military movements in Peru were suspended, in hopes that through the good offices of the United States some practical solution might be found. I could scarcely expect such a suspension to be prolonged through the two months (and perhaps more) which would be occupied in the transmission of my dispatch and the receipt of a reply. And I think it is evident that not only the interests of the belligerents but the position of the United States require a prompt decision as to the extent to which the government will further intervene in this matter.

I think the conditions imposed by Chili are hard. I am not at all sure that any representation by the United States will induce Peru to accept them. Chili not only desires, but needs peace. The occupation of Peru is a very heavy drain upon her population, and although its immediate expenses have so far been borne by Peru, the resources of Peru cannot long stand such an imposition, and the cost of the continued occupation and the further military operations which must be undertaken will then have to be defrayed by Chili. Peru may prefer to wait until these embarrassments develop rather than to cede territory at present, but I ought not to conceal from you my conviction, which at present I can only state to you as a conclusion without the reasons, that Peru is powerless to help herself. There is no government and very little prospect of the establishment of a stable one, and her power of military resistance to the Chilian forces anywhere seems absolutely null.

Without the intervention of the United States Chili can, and will, compel Peru to accept any terms she may choose to impose, or she will define her military occupation to suit her plans of annexation and leave the rest of Peru to anarchy.

It is possible that the terms of peace, which I sent you by telegram, may be modified at the earnest remonstrance of the United States. I have very little doubt, not only from what I learn here, but from recent dispatches from Mr. Adams, that Bolivia is willing to make peace at the cost of her littoral on the Pacific. This, with the cession of Tarapacá, is ample indemnity and security for Chili. The imposition of twenty millions more upon Peru as indemnity and the prolonged occupation of Arica seem to me to be very extreme conditions.

But the cession of Tarapacá is unavoidable, unless the United States means to intervene forcibly, and in the present condition of Peru such an intervention would have to be undertaken by the United States, with no assistance from Peru herself which would be worth considering.

It is under these circumstances that I suggested that I should be

allowed to recognize the necessity of that cession and offer the good offices of the United States if the other terms were modified. It is unquestionably important to Chili to obtain a peace, and the good offices of the United States will relieve the embarrassment in the way created by the arrest of Calderon and the disorganized condition of the Peruvian Government. The government of Montero or anybody else which would make peace, through the United States, would be recognized.

But it is difficult so say how far the recommendation of the United States would now be received by any government in Peru. The action of Mr. Hurlbut, whether intentional or not, has so exaggerated the belief in the Peruvian mind of the certainty and efficacy of the intervention of the United States to prevent any cession of territory that I am not prepared to say that any Peruvian Government will be willing or strong enough to accept such terms, and Chili naturally expects that if she accepts our good offices we will, upon failure of a satisfactory result, refrain from any further interference.

In all this I have assumed that the government has not yet considered the possibility of a forcible intervention on behalf of Peru, and in my telegram I intended to convey the idea that, in my opinion, some modification of the terms may yet be reached which would allow the United States to recommend their adoption to Peru.

I have, &c.,

WM. HENRY TRESCOT.

No. 19.

Mr. Trescot to Mr. Frelinghuysen.

No. 6.] SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,

Viña del Mar, Chili, January 27, 1882. (Received March 7, 1882.)

SIR: On Thursday, January 26, 1882, I sent you a telegram requesting that neither any of General Kilpatrick's dispatches nor my instructions be published.

The reasons for the telegram are these:

In the first interview with Mr. Balmaceda, I called his attention to certain dispatches from Mr. Christiancy, Mr. Osborn, and General Kilpatrick, informing their government of the wish and purpose of the Chilian Government to establish and strengthen the Calderon government in Peru.

General Kilpatrick's dispatches went further, and assured the department that both the late and present Chilian Government were prepared to conform to the wishes of the United States, give the Calderon government a cordial support, and make no demand for cession of territory until full opportunity had been given to Peru to pay an adequate indemnity.

The secretary appeared a good deal surprised when these dispatches were read and said that while he was unauthorized to say what had passed between General Kilpatrick and the late government, he could certainly say that no communination on the subject had ever taken place between himself and General Kilpatrick.

Some days after he called on me, and said that he would like to address me a confidential note in reference to Kilpatrick's despatches, but as the General had detailed private conversations with very prominent and distinguished officials, which they wished to contradict, he did

not desire that his letter should be published, and this would be obligatory upon him if these dispatches of General Kilpatrick were published in the United States. I thought his suggestion judicious, for the reason that I had had the opportunity of learning somewhat of the conference to which General Kilpatrick refers. In his dispatch he alluded to a gentleman of great consideration, a member of the Chilian Congress, a very distinguished lawyer, who had held cabinet position, and who has been remarkable for the moderation of his views in regard to the settlement of the terms of peace. He attributes to this gentleman a large part in the conference and its results. The gentleman to whom I refer assured me that so far as he was present or informed, General Kilpatrick's statements were calculated to give an entirely erroneous impression of what had occurred, and the detail which he gave me satisfied me that the officials to whom General Kilpatrick referred would contradict his most positive assertions.

Mr. Balmaceda admitted that the dispatch was sufficient to justify the action of the United States, and in correcting it, he was anxious to avoid an unpleasant issue as to the correctness of the statements of one who was now dead, and whose long and painful illness was a sufficient explanation of any misconception of facts into which he may have been led.

As the papers just received contained the publication of a large portion of the correspondence with our ministers at Lima and Santiago, and as further publication seemed to be expected, he expressed a wish that I would telegraph. I included my instruction in the request, as a large portion of General Kilpatrick's dispatch is incorporated in it. Of course, the secretary did not ask that my instructions should not be published, as he has not seen them, and did not know what they contained. But to make the two requests separately would have increased considerably and unnecessarily the cost of the telegram.

In this connection, while I do not doubt that a controlling necessity of which I am not informed, required in the discretion of the Department the recent publication of much of its correspondence with the United States ministers at Lima and Santiago, I ought to say that the publication has not helped me.

The dispatches have all been republished here, with the editorial comments of the home papers, and the impression has been unfortunately made that the administration had some policy which had excited strong popular opposition, and that the government found itself compelled to explain away what was deemed objectionable. The inference drawn from this is that I am not empowered to take anything like strong or positive action in reference to the settlement of the terms of peace. I need not add that some uncertainty on the part of the Chilian Government, as to the extent to which the United States were prepared to go, until in the natural development of the negotiation it was officially informed, would not have been without its influence in recommending a reasonable modification of the terms.

I have, &c.,

WM. HENRY TRESCOT.

No. 20.

Mr. Trescot to Mr. Frelinghuysen.

No. 7.] SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,

Viña del Mar, January 27, 1882. (Received March 7, 1882.)

SIR: I ask to call your attention to a circumstance which may create some embarrassment in the negotiation here.

When I was about leaving Washington the Secretary of State informed me verbally that the President had decided to invite a congress of the North and South American powers to meet at Washington, and (as I understood) that the invitations to the Governments of Chili, Peru, and Bolivia would be placed in my hands to be delivered under such circumstances as would not interfere with the progress of the present negotiation.

These invitations have been sent but to the respective ministers accredited to these governments. I think you will appreciate the impossibility of tendering such an invitation to Chili until the result of the negotiation has ascertained our friendly relation. It would be exceedingly unfortunate if either Mr. Hurlbut or Mr. Adams should deem it incumbent upon them to extend this invitation to Peru and Bolivia, while it was not extended to Chili. I have written to both of these gentlemen, asking that they would take no action until after consultation with me. While I hope that they will recognize the propriety of this request, I cannot be sure that they will regard this invitation as belonging to the duties attached to the special mission, and they may, perhaps, regard its communication as belonging to the ordinary duties of the resident legation, with which I am not authorized to interfere.

I have not deemed it judicious to make any reference to it here, for I am apprehensive that the Chilian Government might construe it into a threat of an appeal against its proceedings, especially if I am finally compelled to carry out instruction No. 2.

I have as yet no reason to suppose that the Chilian Government is informed of the invitation, but as it has already been communicated to some of the governments, it cannot be long before it is generally known. If the instructions which I receive in reply to the telegram enable me to negotiate a modification of the terms of peace which can be recommended to Peru, I shall have no hesitation in communicating to the Government of Chili the purpose of the United States.

But if, unfortunately, that should not happen, and the United States should be compelled to withdraw its offer of good offices, it will be equally difficult to communicate the invitation or to withhold it.

In the first case the expression of our grave disapprobation of the refusal of moderate terms of peace may irritate the Chilian Government to a point that may lead to its refusal, putting aside the apparent inconsistency on our part of the two proceedings. While in the latter case the omission of Chili will be so marked as almost to necessitate the withdrawal of the Chilian minister from Washington and the consequent interruption of our friendly relations.

I cannot expect to receive instructions on this subject in time to be relieved from the responsibility which the circumstances may impose upon me, but I trust the Department will appreciate the difficulty in which such a contingency may involve me.

I have, &c.,

WM. HENRY TRESCOT.

No. 21.

Mr. Trescot to Mr. Frelinghuysen.

[Telegram.]

SPECIAL MISSION,
Santiago, February 2, 1882.

FRELINGHUYSEN, *Washington:*

Have no reply from you answering my telegram of twenty-third. Very desirable.

TRESCOT.

No. 22.

Mr. Trescot to Mr. Frelinghuysen.

No. 8.] SPECIAL MISSION OF THE UNITED STATES
IN SOUTH AMERICA,
Viña del Mar, Chili, February 3, 1882. (Rec'd March 7, 1882.)

SIR: Referring to my dispatch, numbered seven, I have to inform you that after mailing it I received a letter from Mr. Hurlbut, saying that he had already extended the invitation of the President to the Government of Peru to attend the proposed congress in Washington.

This action, of which I had been so apprehensive, rendered it necessary that the invitation should also be extended to Chili, for I had no doubt that the fact would be published in the Lima papers. And by the last mail from Lima, I find that not only the fact but the invitation in full has been published.

I therefore wrote to Mr. Adams, at La Paz, and to Mr. Blaine, who is *chargé de'affaires* here, to say that I desired them to consider my request for delay in the presentation of the invitation as now withdrawn. These letters, with one to Mr. Hurlbut in reply to his information, will be found in inclosures numbered 1, 2, and 3.

As an interview with the Secretary for Foreign Affairs had been appointed for Tuesday last (January 31), Mr. Blaine accompanied me, in order to read the invitation in conformity with his instructions.

Our interview had been arranged for the purpose of comparing our respective drafts of a protocol summarizing the substance of our former confidential conferences, a proceeding to which the Secretary seemed to attach considerable importance. After reading over Mr. Balmaceda's draft in Spanish, and receiving a copy for more careful consideration, I explained to him the purpose of Mr. Blaine's visit. To my great surprise, he expressed the wish that Mr. Blaine would not read the communication, and then, turning to me, he said, "It is useless. Your government has withdrawn the invitation." Seeing, I suppose, an expression of astonishment, which I did not pretend to conceal, he added, "Your own instructions have been changed. Your instructions from Mr. Blaine have been published, and others are on their way to you modifying your original instructions in very important particulars. The whole question about Calderon is out of the way, and you are told to be entirely neutral."

I replied, "I do not understand that there is any such thing as a Calderon question between us," and then said, "Do you mean, Mr. Secretary, that both my original instructions and the instructions from the present administration are published?"

He said, "Yes, before you have received them I have a telegram; not in cipher, but open," to which I replied that I supposed so, because I could not see the use of a cipher dispatch in referring to papers already published.

He added, "Yes, they have been published, and will be soon published here in La Patria" (a newspaper). He then went out of the room and returned with a telegram which, he said, had come from Paris only two days before, and of which he read me the first line, which, as I recollect, was, "The Blaine-Trescot instruction has been published," and then paused, smiling and looking over the telegram, as if he were uncertain whether he should communicate the rest. I said, "As you say that all this is confidential, don't make a half confidence of it. If I am to receive my instructions through you let me know them in full." He smiled, shook his head, and folded up the telegram, saying, "This, however, will not interrupt our negotiation," and then proceeded, at some length, to state why and to explain what he considered the advantages of the condition of things under the new instructions.

I said to him, "That may all be so, Mr. Secretary, but I think that a diplomatist of ordinary experience would conclude, when he learns that his instructions have been communicated to the government with which he is negotiating, before he receives them himself, that it is time for him to be silent until he does receive them. I think there must be some mistake about all this, but at any rate I must decline to say a word more until I learn from my government what it has done and what it means me to do."

He said that he hoped that I would receive my instructions very soon; that the position was strained and could not be maintained for an indefinite time, that is, Chili could not wait much longer for the United States to decide what action it would take, and then, for the first time in our conferences, his manner became excited and his language somewhat too demonstrative. "Since you have been here," he added, "two occurrences have taken place which I am sure are disagreeable to you as they are to Chili. Mr. Hurlbut has refused to consent to the export of certain goods from the blockaded port of Mollendo, unless we will consent to the import of coal, an article contraband of war, for the use of the railroad, and although we have a right to disregard his refusal, we have not done so. And secondly, Mr. Adams, in Bolivia, has addressed a letter to the government at La Paz, advising themof your mission, and endeavoring to induce them not to make a separate peace before Peru has effected some arrangement, and I do not know how long Chili can bear such interference."

I said, "Mr. Secretary, the facts which you state are grave, so grave that even in the most confidential conversation, I will not express an opinion, unless you communicate them to me officially; then I will meet the questions you raise."

He said, "I have no intention of doing so; I did not even intend to draw a confidential answer from you."

There the interview ended.

The facts of Mr. Hurlbut's action, as I have heard them, are these: At the blockaded port of Mollendo, on the Peruvian coast, there has been a large accumulation of produce waiting for exportation. An application was made by Mr. Adams, without consultation with Mr. Hurl-

but to the Chilian authorities in Lima for license to certain mercantile firms, German, I believe, to take out their goods. Fearing that such permission might be considered as an abandonment of the blockade, the Chilian authorities asked the consent of the diplomatic corps in Lima to the issue of the license. Mr. Hurlbut replied that the only American interest in Mollendo was the railroad from Mollendo to Puno, and if that corporation were allowed to import the coal and supplies necessary for its wants he would consent.

You will observe that these facts, if correct, furnish ground for a very different estimate of Mr. Hurlbut's action than that made by the Secretary for Foreign Affairs. But as I had no official information, either from Mr. Hurlbut or from the Chilian Government, I deemed it injudicious to enter upon any confidential discussion of the subject.

As to Mr. Adams there has been a general impression here that Bolivia had consented or would consent to a separate peace with Chili, by which, in exchange for her littoral territory upon the Pacific, she would be indemnified by some cession of Peruvian territory. When Mr. Adams returned to La Paz he communicated the purpose of the special mission to the government, and did, I believe, succeed in inducing them to suspend any such action until it could be ascertained if the good offices of the United States could effect a general and satisfactory solution. In this I conceive that Mr. Adams was only acting in the line of his duty, but I did not deem it proper to discuss it in a confidential or informal way, for reasons which I think will be obvious to you.

Having thus given you a concise account of the interview, you will allow me to express the hope that my conduct will be approved. My original instructions were in the alternative, and if I failed to obtain such a settlement as the President deemed he had a right to expect, I was directed to take certain action, which could not have been agreeable to the Chilian Government. I could not suppose that such an instruction would be made public while I was endeavoring to secure, and not without some hope of success, the amicable solution of this delicate and difficult question. Still less could I believe that if my original instructions had been seriously modified any communication of such change would have been made to the public, or even confidentially to the Chilian Government, before I could possibly have received it. I could not admit, what the Secretary's conversation clearly implied, that I did not represent the wishes or intention of my government, and that he was better instructed than myself as to the purposes of my mission.

But as his language and action were evidently based upon his confident knowledge of these supposed instructions, any further conference with him was useless until I heard from the Department.

As both the telegram, which I received upon my arrival at Valparaiso, and that of the 10th of January, which reached me only on the 31st ultimo, the translations of which are herewith inclosed, indicated the propriety of very great caution in the execution of my original instructions, and as my telegram of January 23, stating the terms upon which Chili would accept the good offices of the United States, and a reply to which was absolutely necessary for any further negotiation, had not yet been answered, I have determined to do nothing whatever until the receipt of instructions from the government.

I have, &c.,

WM. HENRY TRESCOT.

[Inclosure 1 in No. 8.]

Mr. Trescot to Mr. Adams.

SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Viña del Mar Chili, January 30, 1882.

SIR: In my last communication, transmitting the dispatches which had been intercepted, I called your attention to that one in which you were instructed to convey to the Government of Bolivia the invitation from the President of the United States to that government to send representatives to the proposed Peace Congress at Washington.

In doing so, I asked you to suspend action upon this instruction until you heard further from me on the subject. In the mean time I have been informed by Mr. Hurlbut, the minister of the United States at Lima, that he received similar instructions, and has already communicated them to the Government of Peru. He does not say to whom he has communicated them, as the representative of that government.

You will understand that however inopportune I may consider this communication of Mr. Hurlbut, it renders necessary the communication of the invitation to the other powers.

You will therefore consider the request for delay which I made you, as now withdrawn.

I beg to acknowledge your communication of January the 12th, with its inclosure. I am waiting in hourly expectation of telegraphic instruction from the Department, upon the receipt of which I will write you again.

I am, &c.,

W. H. TRESCOT.

[Inclosure 2 in No. 8.]

Mr. Trescot to Mr. Walker Blaine.

SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Viña del Mar, Chili, January 30, 1882.

SIR: The reasons which induced me to ask you to withhold for the present the invitation from the President of the United States to the Government of Chili to take part in the proposed Peace Congress at Washington are known to you.

The dispatches which I have addressed to the department upon this subject have also been communicated to you, and you are aware that a similar request was made of Mr. Hurlbut, at Lima, and Mr. Adams, at La Paz.

I have received from Mr. Hurlbut a communication under date of January 18, in which he informs me that he has already communicated this invitation to the Peruvian Government.

However inopportune I may consider this communication, it renders the delivery of the invitation to the Chilian Government at once absolutely necessary.

My request that the invitation be withheld is therefore now withdrawn.

I have written to Mr. Adams to the same effect, and inclose you copies of my communication to Mr. Hurlbut and myself.

I am, &c.,

W. H. TRESCOT.

[Inclosure No. 3 in No. 8.]

Mr. Trescot to Mr. Hurlbut.

SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Viña del Mar, Chili, January 30, 1882.

SIR: I have to acknowledge your communication of January 18, in which you inform me that you have received and communicated to the Peruvian Government the invitation from the President of the United States to the proposed Peace Congress in Washington.

The circumstances under which I asked that you would suspend action upon this instruction until after consultation with me were these:

When I was about leaving Washington I was informed by the Secretary that such an invitation would be issued, indeed that it had already been sent to Mexico and Guatemala. I understood that the invitations to Chili, Peru, and Bolivia were to be sent through me to be delivered as the circumstances of the anticipated negotiation seemed to render opportune.

Not finding any such instruction, I telegraphed and wrote from Panama, saying in my dispatch of December 12, "I beg to inform you that the mail contains no such communication, and it will occur to you without suggestion from me that if at some later date these invitations are transmitted to the ministers at Lima, Santiago, and La Paz they should be instructed not to present them without my knowledge and approval. Their delay might, under circumstances by no means improbable, cause very serious embarrassment in the conduct of the special mission with which I have been charged. A reference to my instructions will, I think, sufficiently explain my meaning."

The difficulty which I anticipated must, I think, have occurred to you.

I could not with any fitness extend this invitation to the Chilian Government until I had ascertained what were the relations between us. If the negotiations should terminate in failure, disturbing the amicable relations between us, the invitation would be either offensive or idle; Chili might, if irritated by the position of the United States as defined in my instruction, construe it to mean an appeal to the public opinion of the American republics against her. But still more important was it that this invitation should not be communicated to Peru and Bolivia without at the same time being communicated to Chili.

My hope therefore was that Mr. Adams and yourself would wait until the time came when the invitation could be properly extended to Chili. I thought it not improbable that you would consider the instructions sent you in reference to the special mission, as sufficiently indicating that all questions bearing upon this very delicate and difficult negotiation were to be left to my discretion.

But if your instructions did not in your opinion bear this construction, I felt sure that you would, at my request, co-operate with me in such a line of conduct as, in my judgment, seemed necessary here. I can only regret therefore that my request reached you too late, and after you had carried out your instructions as you understood them.

The communication of the invitation to Peru of course now renders it absolutely necessary to extend the invitation to Chili at once, and I have so informed Mr. Blaine to whom, as the successor of General Kilpatrick, the invitation is intrusted.

I have also written to Mr. Adams that he will consider my request of delay on his part as now withdrawn.

I am, &c.,

W. H. TRESCOT.

[Inclosure No. 4 in No. 8.—Telegram. Received January 4, 1882.]

Mr. Frelinghuysen to Mr. Trescot.

WASHINGTON, *January* 4, 1882.

Exert pacific influence. Avoid any issue leading to your withdrawal from Chili.

FRELINGHUYSEN.

[Inclosure 5 in No. 8. Telegram received by mail January 31, 1882.]

Mr. Frelinghuysen to Consul at Panama.

Mail following to Trescot:

President seeks to extend friendly offer, impartially to both republics. Exert pacific influence. Avoid issue leading to offense. The Calderon affair and its surroundings can be attended to here when you come home. We prefer that you do not return by Buenos Ayres.

No. 23.

Mr. Trescot to Mr. Frelinghuysen.

No. 10.] SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,

Viña del Mar, Chili, February 3, 1882. (Received March 7.)

SIR: Referring to my dispatch No. 6, January 24, I have the honor to inclose copies of the confidential letter of Mr. Balmaceda, the Secretary for Foreign Affairs, and my reply thereto.

I have, &c.,

WM. HENRY TRESCOT.

[Inclosure 1 in No. 10.—Translation.]

Señor Balmaceda to Mr. Trescot.

[Confidential.]

REPUBLIC OF CHILI, MINISTRY OF FOREIGN AFFAIRS AND COLONIZATION,
Viña del Mar, January 27, 1882.

SIR: In the confidential conference that we had in the Department of Foreign Affairs in Santiago, on the 16th of the present month, you made known to me the text of the official communication which Mr. Kilpatrick, the minister plenipotentiary of the United States in Chili, addressed to his government under date of August 15, last year. The moment I heard it read I observed to you that it contained serious errors and grave inaccuracies, asking you for a copy of it. You had the kindness to send it to me on the 17th day of the present month of January, with a confidential letter in which you copy for me a part of another official communication addressed by Mr. Kilpatrick to his government on the 2d of December, last year.

In the confidential conference that we had on the 19th of this month, in the same Department of Foreign Affairs in Santiago, I pointed out to you the errors of fact and inaccuracies of appreciation which the said dispatches of Mr. Kilpatrick to his government of the 15th of August and the 2d of December contained.

I think proper, considering the delicate diplomatic situation of the two governments, to put into writing the verbal declarations made to you by the undersigned in the two conferences referred to.

With regard to the communication of the 15th of August, I told you that the present President of the Republic, Mr. Santa Maria, and Mr. Joseph Francis Vergara, the minister of war and navy, on the 15th of August, 1881, and now minister of the interior, had never spoken to Mr. Kilpatrick about the war on the Pacific, nor about the instructions of Mr. Blaine, nor about the conditions of peace, nor had ever made, as it is natural to understand, a promise of any kind to Mr. Kilpatrick; that my honorable predecessor, Mr. Valderrama, and Messieurs George Huneeus and Luis Aldunate, having met together in the house of Mr. Kilpatrick, to whom he wished to make known his instructions, Mr. Huneeus confined himself to reading and translating them, without either Mr. Valderrama or Mr. Huneeus or Mr. Aldunate giving or pronouncing any opinion about them; that Mr. Kilpatrick, having spoken to Mr. Aldunate, before he was secretary of the treasury, about the advantage of Chili, bearing in mind the wishes of his government with regard to the not annexing of Tarapaca by means of a legislative act only, but rather by the natural consent of a definite treaty of peace, Mr. Aldunate stated to him that it was an idea worthy of being taken into consideration which reply Mr. Aldunate personally informed me of about the time the said conversation took place; and finally that the ideas that constitute the basis of the purposes disclosed in the instructions of Mr. Blaine had not been accepted, as is alleged, by any of the persons referred to in the dispatch of August 15, 1881.

In reference to the note of the 2d of December, 1881, I told you that Mr. Kilpatrick had spoken to me three times before my taking charge of the office of Secretary of Foreign Affairs about the instructions of Mr. Blaine, and that on the three occasions I answered Mr. Kilpatrick that I had formed no opinion about them, leaving it to the government of Mr. Pinto, or that of Mr. Santa Maria, about to be inaugurated, to pronounce an opinion about any matter of exclusive jurisdiction of public power; that after the 18th day of September, 1881, the day on which I was named secretary of foreign affairs, although I saw Mr. Kilpatrick several times, then very sick and almost always in his bed, I did not speak with him about the instructions, or the wishes of his government, but in reference to the note of October 8, 1881, which I was obliged to address to him in consequence of the publication of the memorandum of Mr. Hurlbut to Mr. Lynch. In that communication the government of Santa Maria defined its future policy in the war, and the necessary conclusions of peace; and on my part there was neither then, nor afterwards not even an insinuation that would authorize Mr. Kilpatrick to give to his government the assurances that he gave in the name of Chili in his dispatch of the 2d of December, 1881.

I added that Mr. Kilpatrick wrote to his government under the constant influence of a specially grave infirmity, and that he composed his dispatches falling into very serious and without doubt involuntary errors. No reason is seen, nor can any be imagined, that would induce him to act in an opposite manner to that which he always displayed for the maintenance of friendship and cordiality between the Governments of Chili and the United States; but I would fear to compromise that same good and cordial understanding if I did not put into writing the declarations substantially as I made them to you in the conferences of the 16th and 19th of the present month of January.

The note of the 22d of November, 1881, of Mr. Blaine to General Kilpatrick, made

public, and in which is copied a part of the dispatch of Mr. Kilpatrick to Mr. Blaine, on the date referred to, of the 15th of August, 1881, especially obliges me to proceed in this manner.

With expressions of the highest consideration, &c.

J. M. BALMACEDA.

[Inclosure 2 in No. 10.]

Mr. Trescot to Señor Balmaceda.

SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Viña del Mar, Chili, January 30, 1882.

SIR: I have the honor to acknowledge the receipt of your letter of the 27th instant, marked "confidential."

I found in it a fuller and more precise statement of the general remarks which you made at the conference between us, when the dispatches of General Kilpatrick were communicated to you.

When I called your attention to these dispatches I of course recognized your right to correct any misconception of the purpose or language of the government into which General Kilpatrick may have fallen, and I have now to express my satisfaction at the courteous manner in which you have pointed out what you consider to be such misconception.

Your frank recognition at the conference that the action of the United States Government was properly based upon the confidence which it naturally reposed in its diplomatic representative in Chili, and resting upon this information, was guided by due consideration of the rights, interests, and supposed wishes of Chili, relieved this incident of any unpleasant influence upon our discussions, and will, I hope, render any further reference to it unnecessary.

But you will readily understand that in receiving and transmitting to my government this communication, it is my duty to guard against any admission that General Kilpatrick was alone or altogether in error.

After many years of varied, brilliant, and honorable service he died in the discharge of his duty. How far the long and severe illness, to which you refer with such kindly and honorable sympathy, incapacitated him for the grave responsibility with which he was charged, I am unable to judge, especially when you call to my attention that between the dates of the dispatches of August 17 and December 2, there passed between you and himself the communications of October 8, in which were manifested the most cordial and complete understanding between you.

That there has been a very serious misunderstanding upon a very important subject between gentlemen alike honorable and responsible, there can be no doubt.

But owing to the death of General Kilpatrick it only remains for me to accept with entire good faith the statements you have made, and to express the conviction that if General Kilpatrick were alive to compare his recollections with yourself, and the distinguished gentlemen whom you represent, the apparent misunderstanding would be explained to the satisfaction of all the parties concerned.

With sentiments of the highest consideration, &c.,

WM. HENRY TRESCOT.

No. 24.

Mr. Trescot to Mr. Frelinghuysen.

No. 12.] SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Viña del Mar, Chili, February 24, 1882. (Received April 4.)

SIR: I inclose herewith translation of the cipher dispatch received by telegraph on February 22, and the answer in cipher which I sent to-day.

I would have cabled earlier, but that I have been endeavoring from the date of your cipher instruction of February 4 to obtain some modi-

fication of the terms which I sent you in telegram of January 23, as those which Chili would accept as the basis on offer of good offices from the United States.

You may assure the President that I have urged upon the Government of Chili the wisdom of moderation in the terms which it demanded. But Chili is determined to have Arica and Tacna, as well as the territory south of the Quebrada of Camarones (Tarapacá). The indemnity of twenty millions, with this region of country as a pledge, was only an indirect mode of securing the country itself.

Peru has not, that I can see, any capacity of resistance in herself, and Chili will not yield to any merely friendly persuasion.

I ought to inform you that when, upon the receipt of your telegram of the 22d instant, I asked the Secretary for Foreign Affairs for a positive answer whether his government would modify the terms of peace, he said that the government was very much embarrassed by the publication of my cipher dispatch to you of 23d January, of which he had learned by telegram. He said he considered (as I must admit he had a right to consider) that this was a confidential communication to the Government of the United States of the terms which Chili proposed to offer, and that however he might feel disposed to listen to the suggestion of modification, the publication committed his government to their proposals; that they could not now be changed without admitting that they were originally exorbitant, and had been modified under pressure from the United States.

Of the sincerity or force of the argument I shall say nothing now, as it will be my duty to furnish you with the history of this negotiation. But throughout the Secretary has assumed to be in possession of fuller and more accurate knowledge of the wishes and intentions of my government than I have received.

The communication to the Government of Chili of the resolution of the Government of the United States that it will not take part in any negotiation based upon the conditions proposed, and the reply of the Government of Chili that it is not prepared to modify these conditions, practically closes this mission. The formal reply to my communication I will receive to-morrow, but I shall not answer it until I have received an answer to my telegram of to-day. I do not feel at liberty, under recent instructions from the Department, to carry out instruction No. 2, and prefer that the President should instruct me what language I shall use under the circumstances.

I trust that these instructions will also convey my recall and direct me whether on my way home I shall stop at La Paz and Lima, in order to communicate to the Governments of Bolivia and Peru that the Government of the United States has been forced to withdraw its good offices. Under the instructions with which I was originally furnished, I would feel it to be my duty to do so.

I have, &c.,

WM. HENRY TRESCOT.

[Inclosure 1 in No. 12.]

No. 1. Telegram from Mr. Frelinghuysen to Mr. Trescot, dated February 22, 1882, will be found in communication from Secretary of State. [See telegram of that date from Mr. Frelinghuysen to Mr. Trescot, page —.]

[Inclosure in 2 No. 12.—Telegram.]

SPECIAL MISSION,
Santiago, February 24, 1882.

FRELINGHUYSEN, *Washington:*

Chili will not modify peace terms, alleging they are, in deference to the United States, better than the offer at Arica and Lima. Terms are extreme, but Chili is so strong, Peru so weak, that mere friendly intervention will not have effect. Telegraph at once definite instructions what to say and what to do. No use remaining here. Shall I go to Peru and to Bolivia? Shall Blaine remain or return?

TRESCOT.

No. 25.

Mr. Trescot to Mr. Frelinghuysen.

No. 13.] SPECIAL MISSION OF THE UNITED STATES,
IN SOUTH AMERICA,
Viña del Mar, Chili, March 4, 1882. (Received April 17.)

SIR: In dispatch No. 8, I informed you that the Secretary for Foreign Affairs of Chili desired that the conclusions reached in our own confidential conferences should be summarized in a protocol. I therefore prepared for his consideration a draft of the three conferences. For this he then proposed to substitute a draft of his own. Upon comparison I found that while there was a general substantial agreement there was wanting in both a sufficiently full statement of the points of discussion, each of us having naturally dwelt more particularly on the views which he had himself expressed. I therefore wrote to Mr. Balmaceda a letter, inclosing draft of protocol confined simply to the points agreed upon. After mutual correction we adopted the protocol which you will find, in Inclosure No. 1.

I suggested to Mr. Balmaceda that any protocol was premature, as its whole value depended upon the acceptance of the conditions of peace which had been referred to the Government of the United States for consideration.

But he thought that it would restore the confidence of the people and Government of Chili in their old and amicable relations with the United States if it could be understood that the incident of the arrest of Señor Garcia Calderon had been satisfactorily explained; that the special mission was an act purely of friendly intervention, and that Chili was willing to accept the good offices of the United States, if the United States could find, in the terms offered by Chili, the basis of such a settlement as they could recommend to the adoption of Peru. When the terms of the protocol were finally settled I found to my surprise that Mr. Balmaceda desired it should be sealed as well as signed. I called to his attention that this instrument was not an act, but a record. It was simply an agreement that the good offices of the United States would be accepted by Chili, if offered upon certain conditions which I had no authority to accept, and which I only undertook to refer to my Government for consideration and instruction.

He said that it was always the custom in the Chilian Foreign Office to seal as well as sign protocols, and as the protocol itself provided for the reference to and decision by the Government of the United States, and had absolutely no vitality independent of the consent of the Government of the United States, I agreed to execute it as he desired.

In the conversations which preceded the protocol I had read to Mr. Balmaceda the dispatches from Mr. Christiancy, Mr. Osborn, and General Kilpatrick, in which they had informed the Government of the

United States that the Government of Chili had resolved to support the Calderon government in Peru, and in which General Kilpatrick had even gone further and assured the Government of the United States that the Government of Chili was willing to negotiate with Calderon on the basis of a war indemnity without demanding a cession of territory, except in the case Peru was unable to furnish a reasonable indemnity. While, as you have been informed by earlier dispatches, Mr. Balmaceda was of opinion that General Kilpatrick had fallen into very grave errors in his estimate and statement of the views and intentions of the Chilian Government, he frankly recognized that acting upon those dispatches from diplomatic representatives entitled to its confidence, the Government of the United States had in its relations to the Calderon government acted in the interest of peace, and with impartial regard to the rights of both belligerents. He was frank, earnest, and explicit in his disavowal of any intended offense to the United States, and claimed that Chili was only acting in the legitimate exercise of her belligerent rights. That Chili had tolerated rather than recognized the Calderon government, but that it had never rested on any substantial basis, and that its issue of paper money, the constant desertion of its soldiers to the Peruvian troops still in the field, its maintenance of resistance to the Chilian government, and its communication with the armed forces scattered over Peru from Lima, which was in the military occupation of Chili, rendered its continuance inconsistent with the existing authority or the military purpose of Chili.

I told Mr. Balmaceda that if the Calderon Government was recognized by Chili as sufficiently strong, constitutional, and representative to make a treaty of peace and cede Peruvian territory to Chili, it was a government sufficiently strong, constitutional and representative to be recognized by neutrals, and that a reasonable deference to the friendly relations of the United States would seem to have required notice of the intended action of Chili, but I could accept the disavowal as sufficient to withdraw the subject from further discussion and would transmit the explanation to the United States.

But assuming that this explanation would be satisfactory as to the special action of Chili in forbidding the exercise of any authority of the Calderon government within the lines of Chilian military occupation, and even in the arrest of Señor Garcia Calderon, who was commander-in-chief of the Peruvian forces, he could scarcely expect the Government of the United States to recognize as a belligerent right the abolition of all government in Peru by military order and a consequent anarchy which would render any peace impossible; that the neutral powers had rights, interests, and old established relations with Peru, and so long as they respected the belligerent rights of Chili, they were only exercising their own equally clear right in recognizing a government with which they could communicate, and if the United States found itself able to offer its good offices, the acceptance of the offer must imply the recognition of a government with which to deal in Peru as well as in Chili.

When we came to reduce this conclusion to an article in the protocol I found that Mr. Balmaceda was not willing to express himself with the same fullness as in our conversation. I was desirous that the form of words used should represent distinctly the ideas expressed above. I would have insisted on this form but that—

1. I was instructed by your telegram received at Valparaiso January the 4th, 1882, not to make an issue which should terminate the negotiation.

2. I was instructed by your telegram of the 10th to Panama and thence by mail, which, however, only reached me on the 31st, that "the Calderon affair and its surroundings can be attended to here when you come home."

3. When I pressed upon Mr. Balmaceda my preference of the form I had presented, he replied to me by showing me the correspondence between yourself and Mr. Martinez, in which, under date of the 7th January, you expressed the satisfaction of the Government of the United States, with the explanation he had made you on behalf of the Chilian Government. He said he considered that question as settled, and I did not feel authorized to press the matter further. I regret that I had not been informed of this correspondence, for if I had been I should not have considered it proper to reopen the discussion of a subject which had been settled by my superiors at home.

You will observe, however, that in the protocol Mr. Balmaceda confines the exercise of belligerent rights to prohibiting the authority of the Calderon government within the lines of Chilian occupation, and declares that Señor Garcia Calderon is a "prisoner of war," while he at the same time expresses the readiness of the Chilian Government to facilitate the communication of the diplomatic representative of the United States with any Peruvian authority whom he may recognize as authorized to negotiate with him.

The rest of the protocol needs no comment. My instructions had no reference to forcible intervention, and the avowed purpose of my mission was if possible to bring the belligerents to a friendly understanding, and there, could therefore, be no possible objection to saying so.

I was also expressly instructed not to offer the mediation of the United States unless it was solicited, and mediation of necessity implied the consent of both belligerents.

The terms of peace being such as Chili was willing to offer, it was her right to state them in such language and to such extent as she deemed proper.

And you will observe that the withdrawal of the United States from any further intervention is conditioned upon her approval of the terms and her willingness to recommend them to Peru. In case, as has happened, that the Government of the United States does not approve the terms, and declines to offer good offices upon such conditions, entire liberty of action is reserved.

When the proctocol had been signed, I communicated to Mr. Balmaceda the decision of the United States, which you had made known to me in the telegram of the 4th of February. When I made this communication Mr. Balmaceda desired that I would so modify the language as not to qualify the terms offered. I was willing to substitute a milder phrase for the word "exorbitant."

But this did not satisfy him. He said he thought that the offer of good offices having been accepted in a friendly spirit, and in special deference to the United States, we ought not, in withdrawing it, to censure the terms in such emphatic language.

The withdrawal itself was sufficient. You will remember that the language used was: "The Government of the United States can take no part in any negotiation based both upon the cession of Tarapacá, and a further indemnity of twenty millions."

In the meantime I received your telegram of the 22d, in which you clearly limited the language of the telegram of the 4th.

From the first it might have reasonably been inferred that you would offer your good offices in the alternative, either upon the cession of

Tarapacá or upon a liberal war indemnity, but not upon both combined. Your last telegram only authorized me to accept a liberal war indemnity as the basis of good offices.

I availed myself, therefore, of Mr. Balmaceda's objection to withdraw the letter and substitute that which follows the protocol, and which simply says that the United States cannot offer its good offices on these terms.

This letter, although dated the 14th, the same date as the original, was not really agreed upon until after the receipt of your telegram of the 22. (Inclosure No. 2.)

On the 24th Mr. Balmaceda replied that the Government of Chili was not prepared to make any modification in its terms. (Inclosure No. 3.)

This fact I immediately telegraphed you. This subject is therefore now before you upon the decision of the Government of Chili that it will not modify the terms of peace.

I deemed it proper, while informing Mr. Balmaceda confidentially of your estimate of the terms of peace, not to commit the government by any formal qualification, but to leave you entirely free, upon learning the refusal of the Chilian Government to modify them, to instruct me what answer to make.

I therefore wait to know whether I shall simply accept the refusal and withdraw the good offices, reserving to the Government entire liberty of action as to the future conduct of Chili, or whether I shall state the reason of the withdrawal, expressing to the Government of Chili the belief of the United States that such terms are exorbitant, or whether I shall take any other action such as the Government of the United States shall consider called for under the circumstances.

I have the honor, &c.,

WM. HENRY TRESCOT.

[Inclosure 1 in No. 13.]

PROTOCOL.

At several conferences held in the Department of Foreign Relations at Santiago, on the 16th, 19th, and 20th days of January of the present year, 1882, Mr. William Henry Trescot, Special Envoy Extraordinary and Minister Plenipotentiary of the United States of America, and Mr. José Manuel Balmaceda, Minister of Foreign Relations of the Republic of Chili, discussed in a frank and confidential manner the relations of the United States with Chili and Peru, and of the two last-named nations with one another, exchanging their views in terms reciprocally friendly, and mutually agreed to draw up in this single protocol, the conclusions which they reached in the aforesaid conference.

First. Mr. Trescot having stated that the United States recognized the government of Garcia Calderon on account of friendship towards the contestants and in the interest of peace, and that the government of his country, being the only one which has recognized the aforesaid government by acrediting a representative near to it, might suppose that the arrest of Garcia Calderon was an act of offense to the United States; and Mr. Balmaceda having said that Chili abolished the authority of Garcia Calderon within the radius occupied by her forces, and arrested him with no purpose of offense to the United States or any other neutral power, and making use of her legitimate belligerent rights, there was no necessity for further discussion of this incident.

Second. The armed intervention of the United States in the war which Chili is carrying on with Peru would not be a diplomatic proceeding of the nature of that which is to-day exercised by Mr. Trescot, nor, in consequence would it correspond to the friendly spirit of his mission; and mediation does not conform to the convenience of the belligerents, nor is it solicited by Chili. The United States eliminates from all

discussion the possibility of armed intervention, and would offer mediation only in case that the belligerents showed a desire to obtain it, and when its acceptance would lead to results satisfactory to both belligerents.

Third. The incident of the arrest of Garcia Calderon, the armed intervention and the mediation of the United States, being points eliminated from all discussion and definitely concluded, Chili declares that, as a mark of mutual friendship and confidence, she would accept, if they should be offered, the good offices of the United States in the contest with Peru, provided that the United States, in the exercise of its good offices, accepts the conditions of peace which Chili would be disposed to concede to the enemy; and with the understanding that, if the United States should not obtain the consent of Peru to the conditions of peace, which serve as the basis of its good offices, in that case the action of the United States between the two belligerents should terminate.

Fourth. If the good offices of the United States shall be offered and accepted in the manner heretofore set forth, Chili would give, through her civil and military authorities, every possible facility to Mr. Trescot for communicating with any Peruvian authority or persons to whom he may judge fit to offer his good offices, with the exception of Garcia Calderon, who is a prisoner of war.

Fifth. The bases, in conformity to which Chili will make peace, reserving to herself every right and entire liberty of action, if they should not be accepted by Peru, are as follows:

1st. Cession to Chili of all the territory of Peru situated to the south of the Quebrada de Camarones.

2d. Occupation of the region of Tacna and Arica for ten years, Peru being obliged to pay twenty millions of pesos at the expiration of that time If at the expiration of that time, Peru should not pay to Chili the twenty millions of pesos, the territory of Tacna and Arica should remain, *ipso facto*, ceded to and incorporated in the territories of the Republic of Chill. Peru may fix in the treaty of peace a time longer than ten years, in conformity with the conditions just before stated. If Arica returns to the power of Peru, it shall remain forever unfortified.

3d. Chili shall occupy the islands of Lobos, so long as there shall be guano upon them, and both the net product of the guano, taken from them and that from the mines discovered and being worked in Tarapacá shall be equally divided between Chili and the creditors of Peru.

Finally Mr. Trescott deemed it necessary to telegraph to his government, and await a reply, in order to state whether he can offer to Chili the good offices of the United States in the manner and conditions herein stated.

In testimony of which the Special Envoy Extraordinary and Minister Plenipotentiary of the United States of America, and the Minister of Foreign Relations of Chili, have signed and sealed the present protocol, in duplicate, and in the Spanish and English languages, in Viña del Mar, the eleventh day of the month of February, in the year one thousand eight hundred and eigh y-two.

WILLIAM HENRY TRESCOT.
J. M. BALMACEDA.

[Inclosure 2 in No. 13.]

Mr. Trescot to Señor Balmaceda.

SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Viña del Mar, Chili, February 14, 1882.

SIR: It having been understood between us, as noted in the protocol of the conferences, that I should transmit to the Government of the United States the conditions of peace which the Government of Chili was willing to offer to Peru, through the good offices of the United States, in order to make known to you, if the United States would tender their good offices to the belligerents upon such conditions, I have the honor to inform you that I have made the communication to my government, and am instructed to reply. The Government of the United States, while desirous to offer its impartial co-operation and its friendly aid in such negotiations as may lead to a peace satisfactory to both belligerents, cannot tender its good offices upon the conditions proposed. I am further instructed to inquire whether the Government of Chili is prepared to make any modification of these terms; and. if so, what they are.

Awaiting the honor of a reply, and with the assurances of my highest consideration,
I am, &c.,

WM. HENRY TRESCOT.

[Inclosure 3 in No. 13.—Translation.]

Señor Balmaceda to Mr. Trescot.

REPUBLIC OF CHILI,
MINISTRY OF FOREIGN AFFAIRS,
Viña del Mar, February 24, 1882.

SIR: I have the honor to acknowledge the receipt of your excellency's note dated the 14th of this month, in which you are pleased to communicate to me that, in compliance with the agreement in the conference as testified by the protocol of the 11th instant, you have addressed a communication to your government; that Your Excellency is instructed and authorized to answer in its name; that you were desirous to offer its impartial co-operation and its friendly aid in the negotiations of peace with Peru; that it cannot tender its good offices upon the conditions proposed, and that you are instructed to inquire whether the Government of Chili will modify them, and in what terms.

In the protocol of February 11th instant, the basis was laid down in accordance to which my government would accept the good offices if, for the purpose of procuring peace on the conditions proposed, they were expontaneously offered to it. That I am now instructed that the Government of the United States does not offer its good offices, which is an answer to my government, to the question that was left pending in said protocol.

And finally I have the honor to say to you, in the name of His Excellency the President of the Republic, that we maintain the conditions of peace set forth in the document already cited, because they are demanded by absolute rigorous necessity on account of expenses, and the damages caused by the war, the security of the Republic, and its future stability.

The Government of Chili has ever had confidence in the neutrality and good friendship of the Government of the United States. This friendship and confidence is strengthened without doubt by the declarations contained in the protocol of February 11, and also by those contained in the note which I have the honor to reply to, in which, besides saying that your government will not offer its good offices, you express the desire to tender its impartial co-operation and its friendly aid in the negotiations that may lead the belligerents to the termination of the struggle.

With sentiments of the highest consideration, I have the honor to subscribe myself, your excellency's obedient servant,

JOSÉ M. BALMACEDA.

No. 26.

Mr. Trescot to Mr. Frelinghuysen.

[Telegram.]

SPECIAL MISSION,
Santiago, March 4, 1882.

FRELINGHUYSEN, *Washington:*

Instructions carried out scrupulously. Chili will not modify peace terms. Publication of my instructions and my confidential telegram have rendered modification impossible. Will stay as ordered, but my presence at Washington, with information, will be more useful than remaining here. What communication of the intention of the United States shall be made to Peru and to Bolivia?

TRESCOT.

No. 27.

Mr. Trescot to Mr. Frelinghuysen.

[Telegram.]

SPECIAL MISSION,
Valparaiso, March 15, 1882.

FRELINGHUYSEN,
Secretary, Washington:

After full and friendly interview with minister for foreign affairs,

condition of affairs, in my judgment, requires my presence in Peru. If you do not disapprove, Blaine goes to Bolivia, joining me in Peru after conferring with Adams.

Reliable information from both places is very necessary.

Feel no apprehension of any departure from your instructions. Telegraph me at once.

TRESCOT.

No. 28.

Mr. Trescot to Mr. Frelinghuysen.

No. 15.] SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,

Valparaiso, Chili, March 16, 1882. (Received April 22.)

SIR: Referring to my dispatch No. 10, in which I inclosed correspondence between Señor Balmaceda and myself, in relation to General Kilpatrick's dispatches of August 17 and December 2, I have now the honor to inclose a publication in the *Diario Oficial*, together with translation of the same.

I have, &c.,

WM. HENRY TRESCOT.

[Inclosure 1 in No. 15.]

Abstract translated from the official newspaper of the Chilian Republic, dated Santiago Wednesday, March 8, 1882.

RECTIFICATION.

In the instructions given by Mr. Blaine to the honorable minister of the United States in Chili, Mr. Trescot, mention is made of the notes of August 15 and December 2 of last year, addressed by General Kilpatrick to his government

In the conferences that took place on the 16th, 19th, and 20th of January, the text of those notes was made known, and at the moment Señor Balmaceda objected, immediately addressing an official note to the Special Envoy of the United States, in which he made serious rectifications.

The said notes having been published in the United States, and reference having been made to them in the instructions which Mr. Blaine gave to Mr. Trescot, it is expedient to make known officially, whilst awaiting the arrival of the original documents published in the United States which will authorize the publications of the rectifications by Mr. Balmaceda in Chili, that those notes contain substantial errors.

This rectification being of as much interest for the exactness of the foreign transactions of the Government of Chili as for the cordial and correct understanding with the United States, it is proper that it should be made known that the Government of Chili has objected to the notes of August 15 and December 2 of last year from Mr. Kilpatrick to his government.

No. 29.

Mr. Trescot to Mr. Frelinghuysen.

[Telegram.]

VALPARAISO, *March* 21, 1882.

FRELINGHUYSEN, *Washington:*

Telegram received. Leave twenty-first.

TRESCOT.

No. 30.

Mr. Trescot to Mr. Frelinghuysen.

[Telegram.]

SPECIAL MISSION, LIMA,
(Received in Washington, April 2, 1882.)

FRELINGHUYSEN, *Washington:*

Arrived twenty-eighth. General Hurlbut died suddenly of heart disease on morning of twenty-seventh.

TRESCOT.

No. 31.

No. 17] *Mr. Trescot to Mr. Frelinghuysen.*

SPECIAL MISSION OF THE UNITED STATES,
Lima, Peru, March 29, 1882. (Received April 26.)

SIR: It has become my very melancholy duty to inform you of the sudden death of General Hurlbut, Envoy Extraordinary and Minister Plenipotentiary of the United States in Peru.

He died very suddenly on the morning of the 27th of disease of the heart. There had been no indication of indisposition of any kind, and he got up about seven o'clock in apparently perfect health. He had partly dressed, and was just about washing his face when he fell. For thirty minutes he appeared to suffer greatly, and at the end of that time he was dead. After the first paroxysm he exclaimed, "*Angina pectoris*," and with a very few words to his family, showing that he felt he was dying, he passed away.

An autopsy was held by the fleet surgeon, a physician appointed by General Lynch, the commander of the Chilian forces, and some Peruvian members of the medical profession. I cannot send you in this dispatch the official report of the autopsy, but I can say that the opinion of the fleet surgeon and of the family are one as to the cause of his death.

The peculiar and excited condition of public opinion here has given rise to reports which are so absurd that I do not think they ought even to be repeated. Upon the announcement of his death, General Lynch issued orders that his funeral should be attended with the military ceremonies to which a major-general in the Army would be entitled. But the family declined this courtesy. The funeral was, at their desire, a private one, but General Lynch acted as chief pall-bearer, and there was a very full attendance of the officers of the Chilian Army and Navy.

It is only proper for me to add that the manifestation of public feeling was very demonstrative, and apparently very sincere. The streets through which the funeral cortege passed were thronged, and from the balconies flowers were thrown upon the hearse.

I reached Callao at sundown yesterday, and was first informed of General Hurlbut's death by signal from the flag-ship. I came here by the earliest train I could take after seeing the admiral.

I regret exceedingly that I have not the right to request that his remains should be carried to Panama in a ship of war. The privacy of

such a voyage would be grateful to his distressed family, and the honor to him would have been well deserved by one who, whatever may have been his faults of judgment, meant to serve his country faithfully and honorably. I shall take the liberty of urging upon the admiral a compliance with this wish of the family, for, besides the reasons which I have stated, General Hurlbut has died in the service of his country a poor man.

Mr. Moore, the consul at Callao, has taken charge of the archives of the legation, and, with the uncertainty of my stay here and his entire fitness, I have not felt that I was called upon to interfere.

I have, &c.,

WM. HENRY TRESCOT.

No. 32.

Mr. Trescot to Mr. Frelinghuysen.

(Confidential.)

No. 19.] SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,

Lima, Peru, April 5, 1882. (Received April 26.)

SIR: I must ask that this dispatch be considered entirely confidential. My reason for the request will, I think, be apparent and satisfactory when you have read it.

In dispatch No. 13, under date March 4, I communicated to you the protocol and the consequent correspondence between Señor Balmaceda and myself. The position then established was that the Government of the United States declined to offer its good offices upon the conditions stated in the protocol, and the Government of Chili declined to modify those conditions.

From the date of that correspondence up to the time of my leaving Valparaiso, I had several full and frank conversations with the Chilian secretary of state.

I cannot undertake to repeat these discussions in detail. It will be sufficient to say that on the Sunday before my departure (18th March) the secretary expressed to me in the strictest confidence his willingness to consider the following modifications of his original terms, if Peru would propose them as a substitute:

* * * * * * *

You will see that these are very considerable concessions. Of course I told the secretary that I had no authority to accept them as the basis of an offer of good offices; that I could not even say that as a matter of individual opinion, I would advise their acceptance, and that I did not believe they would be accepted. He thought they would be. All that I felt authorized to do was to bring them confidentially to the notice of the provisional government of Peru.

* * * * * * *

[Note to dispatch No. 19.]

The extracts from this dispatch are sufficient to render entirely intelligible the references in the dispatches which follow.

The President does not deem it proper to publish the modifications of the terms of peace suggested, as they were communicated in confidence to the diplomatic representative of the United States, and as the prospects of negotiations between Peru and Chili cannot be considered as terminated.

For the same reason the explanation of the terms in detail, and the considerations in reference to them by the minister of the United States, submitted in this dispatch, are omitted.

No. 33.

Mr. Trescot to Mr. Frelinghuysen.

[Telegram.]

SPECIAL MISSION OF THE UNITED STATES,
Lima, April 12, 1882.

FRELINGHUYSEN, *Washington:*

Will leave on the 15th, being absent a few days, to see Montero. I believe bases negotiations between the belligerents can be obtained. Is most important I should be in Washington before opening of the negotiations to inform you of facts. Telegraph answer Lima.

TRESCOT.

[The errors in transmission rendered this telegram, as it reached the department, undecipherable This translation is taken from Mr. Trescot's dispatch No. 23.]

No. 34.

Mr. Trescot to Mr. Frelinghuysen.

[Telegram.]

SPECIAL MISSION,
Lima, May 3, 1882. (Received May 8, 1882.)

FRELINGHUYSEN, *Washington:*

Undecipherable telegram contained substance my dispatch No. 19. I had an interview with Montero. He is desirous of peace; preliminary to the negotiations he asks that Government of Chili recognize the provisional government, and grant armistice, allowing the meeting of Congress. Have urged compliance upon the Government of Chili. Still waiting reply. I consider it important that I should be in Washington before the negotiations are opened.

Please to reply by telegraph immediately.

TRESCOT.

No. 35.

Mr. Trescot to Mr. Frelinghuysen.

No. 24.] SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Lima, Peru, May 3, 1882. (Received May 26.)

SIR: Referring to my dispatch, No. 19 April 5, I have to inform you that I left Lima, as telegraphed, on the 15th for Casma, the only open port on the Peruvian coast, and thence proceeded to Huaraz, the seat of

the provisional constitutional government of Peru. The journey having been safely accomplished, no reference to its incidents is necessary. But it is perhaps proper that I should call your attention to the fact that it is scarcely proper that the minister from the United States to Peru should reside within the lines of the Chilian military occupation, and if, as he ought, he goes to the seat of the provisional government he must be prepared to meet great discomfort. Huaraz is an old Indian town one hundred miles from the coast, lying between the Black Cordillera and the Cordillera Nevada, which is the line of perpetual ice. The elevation is high enough to occasion great uneasiness to persons unaccustomed to such elevation, and it can only be reached by the mountain road traveled by the pack-mules which bring to the coast the ore from the silver mines of the province.

I undertook the journey because I believed that the presentation of my letters of credence would strengthen what is unquestionably the real Government of Peru, recognized and obeyed at present by all parties of the Peruvian people. It is, of course, confined in its sphere of authority, is feeble in strength, and restricted in resources, but it is an actual government, and represents whatever Peruvian nationality still exists. You will remember that while accepting the disavowal of the Chilian Government of any intended offense in the arrest of Señor Calderon, I took the ground that such action could not destroy the existence of the Government of Peru, and I felt bound to do whatever was necessary to maintain the recognition of that government by the United States.

I was also authorized, as dispatch No. 19 has informed you, to indicate to the Peruvian Government that certain modifications in the terms of the protocol would be considered by the Chilian Government. The only government in Peru which, under my instructions, I was authorized to recognize was the provisional government; and if there was any possibility of bringing the belligerents to a negotiation for peace, the matter was too important for any but direct communication with the President of Peru himself.

I arrived in Huaraz on Saturday, the 22d April, and presented my credentials to General Montero on Tuesday, the 25th. I inclose the very brief speech which I made, and the President's reply. (Inclosures No. 1 and 2.) After several conferences with Señor Alvarez, the Secretary for Foreign Affairs, he addressed me the letter which you will find in inclosure No. 3.

I found General Montero and his advisers fully alive to the importance to Peru of peace, and perfectly aware that under existing circumstances peace could only be obtained at the cost of great sacrifice. But I am obliged to modify to some extent the impression which I had received in Lima, and which I communicated in dispatch No. 19. I am still of opinion that three-fourths, if not more, of the business men on the coast would make peace at the cost of the cession of Tarapaca, and I believe that the government also recognizes the necessity. But the government is not strong enough to act independently, and the papers from the United States containing Senator Call's speech and your instruction to me of the 24th February have induced a belief here that a practical intervention of the United States to save cession of Tarapaca is still possible.

There is not, in my opinion, the slightest possibility of Peru's contributing anything to such a result. She depends entirely upon the action of the United States. I cannot express too strongly my conviction that the time has come when the United States Government should say dis-

tinctly to Peru to what extent it is prepared to act practically in the way of intervention. As I wrote you, the Chilian Government is perfectly aware that if the United States determine to intervene forcibly, the opportunity must be given to Peru to pay a sufficient indemnity and save the cession of territory. But Chili does not believe that the United States will so interfere, and she will maintain her position until the demonstration of such forcible intervention is made. Peru ought not to be allowed to delude herself with such an expectation if it is not to be realized.

As I have said, General Montero recognized the necessity for peace, and while he was not prepared to accept either the terms of the protocol or the modifications indicated in dispatch No. 19, he was prepared to make an earnest and serious effort for peace upon the preliminary conditions—

1. That the Chilian Government should recognize him as the lawful executive representative of the existing provisional government of Peru. This he undoubtedly is. All parties and factions in Peru have agreed to recognize and obey his authority, and I cannot see how the Chilian Government can expect him to make peace until it is willing to recognize his authority to do so, which can only be derived from his official position as the executive of an actual government.

2. If so recognized, he is a constitutional ruler, although a provisional one, and can only act within the limits of his constitutional authority. A treaty signed by him without the consent of the National Congress would be simply worthless, and he cannot, as an honest and honorable man, pledge himself in advance to any treaty. General Montero therefore asks that the Chilian Government will grant such an armistice as will enable him to call his congress together at Arequipa, the only place where it can be conveniently called. I am so sure that you will consider these requests reasonable that I have urged their concession upon the Chilian Government, and you will find in inclosure No. 4 my letter to the Chilian Secretary for Foreign Affairs.

I addressed him this letter because I had this morning a long interview with General Lynch, the military commander, and Señor Novoa, the representative of the civil authority of Chili here. Señor Novoa, who informs me that he is authorized to conduct the negotiation for peace, was not prepared to act upon my representations, and, as he felt bound to refer the question to his government, I addressed the Secretary for Foreign Affairs directly.

What the terms of peace should be I will not now attempt to discuss. I suppose my views would not be entirely acceptable to either party. But I do think that the requests of General Montero are reasonable, and that their refusal affords a fair ground for protest on the part of the independent powers who desire to see peace restored.

My letter, however, to the Chilian Secretary for Foreign Affairs expresses my views so fully as to render their repetition here unnecessary.

If these requests are granted, I think an earnest negotiation may be expected, with some assurance of a practical result. In that case I deem it of the utmost importance that I be allowed to come home and lay before you the results of my observation here, which I can scarcely do with sufficient fullness in a dispatch. You will then be enabled, I trust, to give definite instructions to the excellent, experienced, and able ministers who have been recently appointed to supply the vacant missions in Chili and Peru.

I have, &c.,

WM. HENRY TRESCOT.

[Inclosure No. 1 in No. 24.]

SPEECH OF MR. TRESCOT TO PRESIDENT MONTERO.

Mr. PRESIDENT: I have the honor to present to your excellency my credentials as Special Envoy Extraordinary and Minister Plenipotentiary from the President of the United States to your Government.

I need not assure Your Excellency of the sympathy felt by the United States in the efforts made by the provisional government of Peru to establish order and to obtain peace. The prompt recognition of Señor Calderon, the continued recognition of the government, after it had been deprived of the eminent and patriotic services of that distinguished citizen, and the earnest and persistent efforts made by my government to find a basis upon which its intervention, in a spirit of equal friendship and respect for all the belligerents, could contribute to effect a secure and honorable peace are proofs sufficient.

It would be manifestly unbecoming in me to discuss the causes which have so far obstructed the success of this endeavor. But I have felt it my duty to wait upon Your Excellency, not without the hope that means may yet be found by which, with mutual and honorable concession, negotiations may be initiated, which will reconcile the interests of all the belligerents and restore the peace so much desired.

[Inclosure No. 2 in No. 24.]

PRESIDENT MONTERO'S REPLY.

Mr. MINISTER: I receive with the greatest satisfaction the credentials of the Envoy of the great republic, called upon, on account of its progressive ideas and unlimited prosperity, to exercise its beneficial influence in the moral order of the continent.

The sympathy of the United States towards the provisional government has not only been demonstrated by the great proofs that you have just shown, but by visible results. Your predecessor, General Hurlbut, whose memory will be preserved in Peru with eternal gratitude on account of his opportune mission near the provisional government of Señor Garcia Calderon, and on account of having strengthened the constitutional government in our country, caused that sympathy to produce unspeakable good at the time.

My government highly esteems the recognition of it, and welcomes with the most profound esteem the mission that you have come to fulfill at this time.

The basis upon which the efforts of your government wishes to make peace, is easy to be understood in justice and in the interest of the entire continent.

It appears that some countries have considered the question of the Pacific as one of simply a private interest between three belligerent Republics. The government of Chili expressed to the neutral powers in its war circular against Peru, that it would not be reasonable to suppose that the government of Santiago would attempt to modify the geographical limits of the neighboring nations. That statement caused the war on the Pacific to be looked upon in that light; but afterwards that government changed, after having solemnly averred it, and therefore the face of the question was completely changed.

The pretensions of Chili, palpable before the war, and exposed after its victories, have transformed the apparent question of private interests among three Republics into a question of continental interest.

To-day the question is whether a State that declares war to settle disputes which are susceptible of a peaceable solution, can, as a consequence of its victories and of the sacrifices that it had no necessity to make, exact not only complete success, but the acquisition of territory and riches to which it never pretended to have a right.

The question is one of conquest; a continental and American question.

In your great nation and the others of this continent, you have to consider if by Chilian preponderance on the Pacific, by means of the appropriation of foreign territories and the boundless wealth they contain, the door would be left open for other encroachments by force of arms and for national changes in consequence of conquest.

Peru has to look forward, as likewise all America, to the influence and the results that these transformations would bring about in the relations between the old and the new continent. Finally Peru has to struggle for the triumph of principle.

Every epoch has its moral progress and some prevailing idea for the good of humanity; Chili has not been capable, with the fortune of its arms, of combating in this war for the triumph of a beneficent idea, but only for usurpation. Peru is capable, in the midst of its misfortunes, of sacrificing its present in order to contribute by determined resistance, toward securing the future of America, and will not abandon that course without disappearing as an independent nation.

The solidity of interests and the nature of the social and political basis upon which the existence of the American states depend, in their internal order and in their external relations, permit us to hope that the generous exertions of the great republic of this continent, in favor of the re-establishment of peace upon honorable and equitable conditions, have not been concluded, since reasons of justice, political morality, and legitimate influence, which initiated them with such a laudable purpose and which is sanctioned by the history and the traditional policy of your government, still exist.

Peru desires peace and is ready to make any concession that will not wound its honor, its rights, and interests, or the rights, honor, and interests of the allies.

Your noble mission will contribute, I hope, to avoid the dismemberment, and with it the destruction of the ancient nationalities of America.

The eminent qualities which adorn and make you personally so estimable are a guarantee for the happy success of these ideas.

[Inclosure No. 3 in No. 24.]

Señor Alvarez to Mr. Trescot.

MINISTRY OF FOREIGN AFFAIRS FOR PERU,
Huaraz, April 26, 1882.

SIR: The mission which Your Excellency has come to fulfill near the Govenment of Peru is another proof of the repeated efforts of Your Excellency's government to bring about peace between the belligerent Republics on the Pacific; but up to now these efforts have only met with two impediments, which cannot be considered insuperable to a peaceful mind. The first is found in conditions which Chili proposes to impose—conditions which I need not define, with particularity since the government of Your Excellency has viewed them as inacceptable as a starting point in its good offices. The second is the resistance that Chili makes to all previous discussion. The purpose is clearly not to allow a discussion, and this determination, which is not reasonable, nor according to the usual practice of modern nations, shuts the door to every way to an arrangement.

Peru wishes peace and is ready to make for that purpose, in concert with its ally, the Republic of Bolivia, any sacrifice that will not compromise the future which both have had the right to expect since they entered the list of independent republics. But it is impossible to know, either the nature of these sacrifices or how far they may go, without a reasonable debate that would carry conviction to the mind. It is not impossible, on the other hand, that Chili itself may become persuaded of the convenience and necessity of modifying its pretension, to some acceptable terms, and it would appear incompatible with the rules of human prudence for Chili itself to place, with unnecessary persistence, obstacles in the path of its own interests.

The inconveniences that appear to have been alleged by Chili at one time against entering into conferences with Bolivia and Peru were on account of the internal dissensions of the latter; but Your Excellency is a witness that they do not exist and that there is only one government recognized without exception from one end of the country to the other; that this government is the emanation of a constitutional congress, and that all factions have yielded to its authority.

It would not be possible to explain in truth how a government recognized by the government of Your Excellency, before which Your Excellency is discharging your mission, and which is the only one in the country, should not be considered by the Government of Chili as the Government of Peru with which to discuss the points of an arrangement. The Government of Chili can do no less than abandon this idea, because by the force of things it has to come to an understanding with some political entity that may represent Peru, and this cannot be any other than the legal government recognized by all the nation.

In such a case, the provisional government being a constitutional government and being bound by a treaty to the constitutional government of Bolivia, it should proceed with its approval in all its resolutions. Therefore the road to peace might be shortened and facilitated if both governments could get together, and Peru arrange the best means of assembling congress, without whose approval any arrangement is impossible.

As Your Excellency's mission is one of peace, I deem it proper to make you the present suggestions, that tend to level the first difficulties which come in the way, and thus to show the sincere wish that my government entertains of reaching it.

With sentiments, &c.

M. ALVAREZ.

[Inclosure No. 4 in No. 24.]

Mr. Trescot to Señor Aldunate.

SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA, LIMA, PERU,
May 3, 1882.

SIR. You are aware that in my last confidential conversation with your predecessor, Señor Balmaceda, it was understood that if the opportunity offered, I was authorized to indicate to the provisional government of Peru, certain possible modifications in the terms of peace stated in the protocol.

I have presented my credentials to General Montero as Vice President of the provisional constitutional government of Peru and have had several conferences with Señor Alvarez, his Secretary of State for Foreign Affairs.

I found General Montero and his advisers fully aware of the importance of peace to Peru and not disposed to conceal from themselves or the country that at the end of an honorable, patriotic, but unsuccessful war, peace would have to be purchased at the cost of great sacrifices. He would have found himself unable to discuss the acceptance of the terms stated in the protocol. But if he was at liberty to assume that these terms were capable of modification, he would gladly, in concert with his ally, the Government of Bolivia, make every effort to reach such modification as would satisfy the just demands of Chili.

But you are aware that the President is only the executive officer of a government which is constitutional while it is provisional. A treaty signed by him, without the authority of the national congress, especially if it should provide for the cession of territory, would be simply worthless.

It would seem therefore only reasonable that before the President makes any overtures looking to peace, he should have an assurance from the Chilian Government on two points:

1. That he will be recognized by the Chilian Government as the lawful executive representative of the provisional constitutional government of Peru.

I think it cannot be denied that at the present moment the government of General Montero, however reduced his forces or restricted his resources, does represent the existing nationality of Peru, and is recognized and obeyed by the Peruvian people.

2. In order to initiate the negotiations which it is hoped may lead to a secure and honorable peace, the President would have to receive the authority of the National Congress to make the necessary concessions. Is the Government of Chili willing to agree to such an armistice as would allow the President to summon congress to meet him at Arequipa, the only place at which it could be conveniently assembled? If so, the President is prepared immediately to call congress together to lay before them the condition of the country, the necessity for peace, and the terms upon which it may probably be obtained. I venture to express the earnest hope that you will find an acceptance of these preliminary conditions consistent with the rights and interests of your government.

It is needless for me to recall to you the fact that General Montero holds his office by virtue of the authority of congress, which gave him power to make peace, but which forbade his doing so on the basis of cession of territory. It is therefore impossible for General Montero to make any promises implying territorial cession in advance. Such promises would have no official weight whatsoever; nor do I think that with due regard to his honor you could ask him to make assurances of such a nature. But I am of opinion that as all parties in Peru have recognized him as the constitutional head of the government, and as Chili has never denied the national existence of Peru, he may rightfully ask, when expressing, as he does, a sincere desire for peace, that his path may be thus far facilitated by your government, and recent instructions received from my government warrant me in expressing to you the earnest desire and hope of the United States that Chili may be able to agree to the requests made by General Montero.

At present it seems to me that the anomalous conditions of the relations between Chili and Peru are the real obstacles to a satisfactory peace. Until Chili recognizes the existence of a lawful and responsible government in Peru, there is no authority with which to deal, and a peace—if such a solution can properly be called a peace—can be reached only by the imposition by force of such terms as Chili may dictate.

Nor can I perceive that these concessions would in the slightest degree weaken the present position of the Chilian Government. The terms upon which the armistice would be granted could provide that there should be no change in the military condition, either by increase of the Peruvian forces or the acquisition of supplies, while the full responsibility of accepting or rejecting the terms of peace would be placed where they must finally rest before any peace can be made secure upon the Peruvian people.

In making these suggestions you will understand that I am acting upon my last

conversation with Señor Balmaceda, rather as a friendly mediator than in my official character as the special envoy to the belligerents. The views of General Montero, as I have expressed them, have been transmitted to my government.

I have furnished a copy of this letter to Señor Novoa, and I beg to request that, as it is most important for my government to be informed of the intentions of Chili, you will send an answer to Señor Novoa by cable as soon as possible.

I avail, &c.,

WM. HENRY TRESCOT.

No. 36.

Mr. Trescot to Mr. Frelinghuysen.

No. 25.] SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Lima, Peru, May 9, 1882. (Received June 2.)

SIR: I beg to forward herewith dispatches from Mr. Walker Blaine to myself, referring to his recent visit to Bolivia.

I have, &c.,

WM. HENRY TRESCOT.

[Inclosure to No. 25.]

Mr. Walker Blaine to Mr. Trescot.

No. 4.] SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Lima, Peru, May 8, 1882.

SIR: Referring to the subject of my dispatch numbered one, and dated Arequipa, March 28, 1882, which is hereunto attached, marked inclosure No. 1, I have the honor to further report that on Wednesday, March 29, 1882, I left Arequipa for La Paz, Bolivia, arriving at the latter place at noon of Friday, March 31. In the afternoon of that day I had the pleasure of receiving visits from Señor Zilveti, Bolivian Minister of Foreign Affairs, and from Señor Del Valle, envoy extraordinary and minister plenipotentiary from Peru to Bolivia. These visits were purely of a personal nature, and our conversation was of the most general character.

On Saturday morning, April 1, I was, however, received officially by Señor Zilveti and, in company with the gentlemen who accompanied me to La Paz, presented to Señor Salinas, the vice-president of Bolivia, and to the ministers of the government, the President of the country, General Campero, being then with the army (consisting of some five thousand men) at Oruro. The conversation between Señor Zilveti and myself, which followed this presentation, is, with one or two noted exceptions, summarized with sufficient accuracy in the memorandum of Señor Zilveti, which was forwarded to you through Mr. Adams, of which a copy and translation are herewith inclosed (marked inclosures 2 and 3).

I had also, during the evenings of March 31 and April 1, two long interviews with Señor Del Valle, the minister from Peru to Bolivia. Our conversation was unreserved and confidential; the principal incident worthy of comment was that Señor Del Valle showed me a memorandum, signed on the 11th of February last by Señor Zilveti and himself, the effect of which is to strengthen the alliance now subsisting between Peru and Bolivia, and by which the two parties agree to act in entire harmony and concert in all negotiations and efforts for peace with Chili. This agreement was shown to me in such confidence that I beg to earnestly request that knowledge on our part of its existence may be kept secret.

Señor Del Valle further stated to me that he feared that his government would not regard with favor the proposition to exchange a portion of its littoral for an interior province of Bolivia, an arrangement which had been suggested by Señor Carrillo, in our conversation at Arequipa. (See my dispatch, inclosure No. 1.) The acquisition of such territory would, in his opinion, add nothing to the revenues of Peru; its care and government would be, in fact, only a source of expense, while the port upon the Pacific which Bolivia would obtain by the exchange is a source of large revenue to

Peru. It was, however, thought Señor Del Valle, possible for an arrangement to be made by which the effective neutrality of some selected port of Peru, for example, Arica or Mollendo, could be guaranteed to Bolivia, and all the imports and exports of that country admitted and dispatched free of duty. In expressing these opinions Señor Del Valle spoke in a personal capacity, as he had no instructions from his government, nor was he informed as to its views. In the opinions expressed by Señor Carrillo, and reaffimred by Señor Zilveti, the suggestion is made that Bolivia will cede her littoral to Chili only as in lieu of an indemnity, and that it shall be clearly expressed in the treaty of peace that acquisition of territory as the rightful result of conquest in war is not in any way recognized, but is on the contrary, expressly disavowed. Señor Del Valle, who was informed of these views of the Government of Bolivia, stated to me that they would doubtless coincide with those of his own government, but he was unable to see how, in accordance with these ideas, Peru could justly surrender Tarapaca. Bolivia yields Atacama only because she finds herself unable to pay a war indemnity, the amount of which is to be specified in the definitive treaty, and which she admits that, as a vanquished nation, she ought to pay. But how can Peru be called upon to cede territory when she is willing and amply able to pay the most liberal indemnity to Chili? I make mention of these views merely for the purpose of pointing out a stumbling-block, which would seem to obstruct united and harmonious effort on the part of Peru and Bolivia to make peace with Chili.

Leaving La Paz on the morning of Sunday, April 2, I arrived in Arequipa on the evening of Monday the 3d. That evening Señor Carrillo, the Bolivian minister, called upon me, and again expressed his desire to proceed to Lima, requesting me to obtain from the Chilian authorities the necessary permission to do so. This, as you are aware, I did, upon returning to Lima, and on April 15 forwarded to him the passport which, at my request, Señor Novoa had obtained for him and for his secretary from Admiral Lynch, but so poor are the postal arrangements that, though Señor Carrillo did not leave Arequipa until the 4th of May, my letter containing the passport and marked upon the envelope as from the special mission of the United States never reached him.

I returned to Mollendo on Tuesday, April 4, and sailing upon the U. S. S. Alaska had the pleasure of rejoining you in Lima on Friday, the 7th. As Señor Carrillo has arrived in Lima, and as you have conferred with him upon the desires and expectations of his government, it is not necessary for me to elaborate views and present facts with which you are entirely familiar. I desire, however, to say—

First. That so far as I can judge, my journey to La Paz and conference with the Bolivian Minister of Foreign Affairs was opportune and productive of good results. A great deal of importance was apparently attached by the Bolivian Government to the protocol signed on the 11th of February last by yourself and Señor Balmaceda. The purport of this paper had been, according to what Señor Zilveti and Señor Carrillo stated to me, greatly misunderstood, and they expressed themselves as pleased with my explanation and with what they at once admitted to be the just and true meaning of the protocol. I am inclined to think that the sensitiveness, natural to a small country like Bolivia, accounted in large measure for the feeling of the government upon this subject. In all our diplomatic correspondence, in the comments of the press of the United States and of Europe, the war has been constantly spoken of as one between Chili and Peru, and the implied slight had, in Bolivian public opinion, been aggravated by the fact that Bolivia was, in the protocol, referred to only in the most casual manner. This feeling was sensibly diminished by the fact that you had, on leaving Chili, at once sent me to La Paz, being unable at that time to make the journey in person, as I took care to explain to Señor Zilveti.

Second. While the war has, up to this time, not been carried on within the limits of Bolivia, and she has for this reason suffered, in comparison with her ally, but slight direct injury, yet it is of very great importance to the country that either a truce or peace should be made, as speedily as possible. Business is at a stand-still; exports from the country, which were for a time entirely suspended, are now permitted by the Chilian authorities only upon payment of onerous duties, and imports are, I think, still, or at all events were very recently, absolutely prohibited. As the government depends for the greater portion of its revenues upon foreign commerce, and as, owing to the state of war, a larger army than usual is now being maintained, the taxation is necessarily increased, and this naturally tends to produce irritation; the danger of revolution (always great) is enhanced, and the continuance of orderly government imperiled. The war has, however, taught the Bolivians (if such a lesson can be learned in so short a time as has elapsed since the downfall of Daza, and if I am to believe the statements of Señor Zilveti) that constitutional and honest government is a possibility, and the men who are truly patriotic, and who desire a well established state, profess themselves as being greatly encouraged by the present public feeling in Bolivia.

Third. Should it prove impossible to save her present littoral (the province of Atacama) to Bolivia, and I do not see how this can be done—and if, as Señor Del Valle and as other prominent Peruvians with whom I have conversed think, Peru is not willing

to sell or exchange for other territory a portion of her sea-coast—if, in short, as the result of the war, Bolivia is to be altogether shut out from the Pacific, then the years of Bolivia's existence as an independent nation are few in number. It is true that Bolivia might find an outlet for a large part of her products, and perhaps an inlet for imports by the river Amazon and the Atlantic Ocean, but for this a large expenditure of money in the construction of railways and the deepening of rivers and the lapse of many years for the completion of the undertaking is necessary; even then her commerce in going to and from the ocean must pass through other countries, and those countries may see fit to impose vexatious duties, and impose other restrictions upon her trade, which would seriously hamper if not destroy it. Nor, supposing this untrue, are the financial resources or public credit of Bolivia equal to this undertaking; and it is more than probable that before its completion, surrounding states, covetous of her territory, would have secured her partition.

Moreover, the geographical position of Bolivia requires, in any event, an outlet upon the Pacific. I am aware that for many years her commerce has not sought ingress and egress by way of her own sea-coast. The ports of Mollendo and Arica have offered superior advantages, but Atacama has proved a valuable check upon Peru, and has prevented her from seriously overtaxing Bolivian imports and exports, fearful lest, should she do so, the country's trade would desert Mollendo and Arica and find refuge in Autofogasta and the other sea-ports of Bolivia. Compacts and agreements were made between the two countries, by which a certain portion of the revenues collected from Bolivian goods at Peruvian ports was to be paid to the former country. At the outbreak of the war, Peru owed Bolivia on this account more than four hundred thousand silver roles (Peruvian dollars). This fact serves to show how unsatisfactory in the past, and how probably unsatisfactory in the future, would be any commercial treaties giving to Bolivia only outlet and inlet through Peru.

Without considering the question as to whether it is best for the interests of the United States and of the world that the nationality of Bolivia should be preserved, I venture to express the opinion that the most feasible way by which, at the present time, her dismemberment can be avoided is by a strong and effective confederation between Peru and Bolivia, preserving to each an independent national existence, but making such an identity of interest as shall render imperative the strict fulfillment of any obligations and treaties into which they may enter. It seems to me that the self-interest of those countries would tend to such an end. Peru fears gradual absorption of her territory by Chili; Bolivia fears her own dismemberment by and division among surrounding nations. Traditions and natural national jealousies would render impossible any close union; self-preservation and resultant benefit would strongly urge upon each the course which I have suggested. I am not unaware of the fact that the interest of Chili would lead her to strongly oppose such a confederation, but, as I have offered this merely in the nature of personal opinion, and as you are better informed than myself, and a better judge of the advantage and practicability of such a political step, I do not consider it necessary to discuss the subject further.

In conclusion, permit me to observe that I cannot but think it of the greatest importance, both to ourselves and to the belligerents, that the United States should, as speedily as practicable, decide what course it will take with regard to the war of the Pacific. It was most embarrassing not to be able to inform Señor Zilveti and Señor Carrillo of the views of my government, as I felt that the great interests of Bolivia now at stake entitled them to ask and to expect a speedy answer, and I think that both for our own prestige and as a matter of justice, Bolivia should not be compelled to wait for longer time than is necessary for a definite decision on the part of the United States.

I further recommend that for the future our minister to Bolivia should be kept fully informed as to the policy of his government and of any action which may be taken by his colleagues at Lima and at Santiago. The unfortunately almost directly contradictory official communications made at one time by our ministers to Chili and Peru would have made the position of General Adams, in Bolivia, had he not fortunately been absent on leave, extremely embarrassing. Without full knowledge and concert of action on the part of our diplomatic representatives any final settlement by our government or any assistance in the solution of this question is rendered almost impossible.

I have the honor, &c.,

WALKER BLAINE.

[Inclosure 1 in No. 4.]

Mr. Walker Blaine to Mr. Trescot.

No. 1.] SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Arequipa, Peru, March 28, 1882.

SIR: I have the honor to inform you that we arrived in the harbor of Mollendo on Sunday, the 26th instant, between two and three o'clock in the afternoon. Mr. Cochran, the agent of the Mollendo and Puno Railway at that place, visited the ship shortly after our arrival, and most kindly placed the facilities of his road at our disposition. Learning that General Adams was at Arequipa, I telegraphed him to await me at that point, and, in accordance with arrangements made by Mr. Cochran, left Mollendo by special train at eight o'clock Monday morning, Captain Belknap and servant, Lieutenant Hale and Dr. Whiting, of the United States steamer Alaska, accompanying Mr. Cuthbert Trescot and myself. Half way between Mollendo and Arequipa we were met by General Adams, who accompanied us to Arequipa, where we arrived about four o'clock in the afternoon. On arriving we were met by the adjutant of Señor Carrillo (now the representative in this section of the government of Vice-President Montero), who accompanied us to our hotel. This morning Señor Carrillo called upon us in person, and I have just come from returning his visit. We have been received with great courtesy and cordiality by all the officials of the government, and those connected with the railway have very kindly placed at our disposition all the facilities afforded by their line.

By appointment, I this morning met Señor Juan C. Carrillo and had a long conference with him. He was formerly minister of foreign affairs of Bolivia, and represented that country at the Arica conference. He is now accredited by Bolivia as minister near the government of Peru and Chili, and is thus far on his way to those countries. Señor Carrillo began by saying that he desired to speak with all frankness and confidence, in which I told him I would heartily concur. He then asked General Adams to read me a letter which he had on the twenty-fifth instant addressed to the general, a copy and translation of which you will find inclosed, marked inclosure 1 and 2. Having listened to the translation of the letter by General Adams, I replied in substance as follows:

"In order, Señor Carrillo, to make a satisfactory and full explanation of and answer to the question contained in your letter, I will begin by recalling to your mind that after the failure of the conference at Arica the United States still persisted in its effort to bring about a peace between Peru, Bolivia, and Chili. As the instructions given to Mr. Trescot have been made public, I can refer to them without embarrassment. From them you will have learned that the government of Garcia Calderon was recognized in Peru by the United States, as the latter power understood that such recognition was desired by Chili and would tend toward the establishment of peace. After the said government had been so recognized by the United States, Chili, without explanation and without notification to the United States, arrested Garcia Calderon and carried him as prisoner to Chili. You will, I think, agree with me that this act, thus unexplained, and in view of the attendant circumstances stated in Mr. Trescot's instructions, might well seem like one of intentional insult to the United States. Mr. Trescot was, therefore, instructed to frankly state to Chili the view which the United States was forced to hold of this arrest, and to request of the Government of Chili an explanation. This lay at the threshold of Mr. Trescot's mission, and was the first point discussed in his interview with Señor Balmaceda. After this had been fully discussed, and Chili had made explanation (and I beg you, sir, to remark that this question was one wholly and only concerning Chili and my government), the conversation turned upon what terms Chili was disposed to offer to Peru as a basis of peace. The conclusions thus reached were afterward summarized in the protocol to which you have referred in your letter. And here I beg you to observe that a protocol of this nature does not differ from a written memorandum of conversation, not being in any sense, as you seem to have understood, a contract or binding agreement. It is not with us the custom to seal such memoranda, but Señor Balmaceda stated that it was the diplomatic usage in South America so to do, and Mr. Trescot assented to it, observing that the seal could add nothing to its force."

"It will perhaps, however, be more satisfactory to examine the protocol itself, which states:

"First. The question of Garcia Calderon, which is of interest only to the United States and Chili is disposed of.

"Second. The question of armed intervention (in effect a declaration of war) is not within the province of diplomacy, and is, therefore, not contemplated by the mission of Mr. Trescot. I cannot but think that such a question is never within the purview of any diplomatic mission.

"Third. The United States will offer mediation (which is almost identical with arbi-

tration) only when conducive to the good of all the belligerents, and when asked by all. Chili states that she does not desire it, and therefore the United States does not offer it.

"Fourth. Referring to the question of good offices Chili states that if the United States will offer them on the basis proposed by herself (Chili) all facilities at her command in Peru shall be extended to Mr. Trescot.

"Fifth. The terms on which Chili will make peace with Peru are stated.

"Finally, it is stated that Mr. Trescot thought it best to telegraph to his government as to whether the good offices should be offered on the conditions named, and awaits a reply, which reply, forming part of the protocol and published at the same time, is stated in Mr. Trescot's letter to Señor Balmaceda. The effect of this reply, you will at once see, was to render the whole protocol blank paper, for in any event and on any supposition, but the first three articles can be regarded as in any way binding, and of these the first states simply a question which concerns the United States and Chili alone, and the second and third enunciate principles recognized in all international law. Mr. Trescot was, therefore, entirely correct when he wrote to Mr. Adams what I now state to you, that nothing had been signed which in any way bound the United States as to its action in this matter.

"Further, permit me to say that this will fully explain why Bolivia is not mentioned in the protocol, for it is evident that if the United States could not offer its good offices to bring about peace with Peru on the bases pr posed by Chili, there was no need of discussing the Bolivian question. If the offer of Chili with regard to Peru was accepted, then the Bolivian question would naturally come up next in order for discussion.

"One matter further: The United States has replied to Mr. Trescot's telegram, stating that she cannot offer good offices or take any part in bringing about a peace based upon both money indemnification and a cession of territory, and that the question as to the future action of the United States has been referred to Congress, and while awaiting the decision of that body it has seemed good to Mr. Trescot to himself go to Peru and to send me to Bolivia, in order to ascertain the intentions and desires of those governments with regard to peace.

"I ought perhaps to add that it was not intended that the protocol referred to should be made public, but, the essential portions having been published in the United States by some mistake (as they were communicated in a confidential cipher dispatch), Mr. Trescot did not consider that he could refuse permission to Señor Balmaceda to publish the entire document."

Mr. Carrillo therefore replied that he was pleased to hear my explanation, and he would state to me with frankness and in confidence what were the views of his government and people. He said that they had been led to believe from the declarations of Mr. Hurlbut in Peru (for during the time Mr. Adams was absent from Bolivia) that the United States would not, in any event, permit peace upon the basis of annexation of territory, and that Bolivia had patiently awaited the result of the influence of the United States, not expecting a forcible intervention, but led to believe that our government would lend its moral influence, as it had done with so much effect in the case of Mexico; that after his return to Bolivia, in the early part of January last, Mr. Adams had informed the government of the mission of Mr. Trescot, and had requested, to which the government had cheerfully acceded, that pending the result of your negotiations in Santiago things might remain *in statu quo;* that just about this time Señor Baptista had been sent as delegate from Bolivia to the proposed congress in Central America, and that secret instructions had been given him to converse, while on his journey, with any men of prominence with whom he might meet in Chili or Peru, that he might inform the Government of Bolivia as to the views of these countries with regard to peace; that at Tacna, Señor Baptista had met Señor Lillo, who, on behalf of Chili, had proposed that peace should be made between his government and Bolivia, to which Señor Baptista replied that his government would not make peace, save after consultation with and with the approval of Peru, and had suggested, speaking for himself, that it seemed best to make a truce rather than a peace; that conferences had been held, and that certain conclusions, subject to the approval of his government, had been assented to by Señor Baptista, but that the Government of Bolivia, would never have agreed to peace, even with the consent of Peru, and this independent of any suggestion or request on the part of Mr. Adams. He also gave me to understand that Chili had offered to cede Tacna, Arica, and Pisagua to Bolivia (all this territory being Peruvian), in exchange for Atacama. Further continuing, Señor Carrillo said that we could not regard it as strange, in view of the attitude of the United States, if Bolivia felt that the time had arrived when it was wise for her to make the best terms possible for herself and by herself, supposing that the United States had finally withdrawn from the question.

I replied that I did not understand that the United States had as yet definitely decided its future policy, and requested him to state to me the intentions of Bolivia.

In answer, he said that he would state them frankly, but begged that his views

might be regarded as personal and confidential. He said that, first, it might be advantageous to consider that the same results could be brought about, without offending either Peru or Bolivia, by a careful use of language. For example, Bolivia could cede territory to Chili. provided it was regarded as in lieu of a money indemnity, and not as a right of conquest; for to affirm the latter proposition to be a recognized principle would, in effect, place the territory of Bolivia at the mercy of any nation stronger than herself, rather than do which she would prefer the immediate termination of a national existence. I replied that I thought that I could safely affirm that my government would never take part in any negotiation for peace which recognized cession of territory, without any other consideration, as the legitimate result of victory in war. He then added that it was absolutely essential to Bolivia to have a free and independent outlet and inlet upon the Pacific, the reasons for which he detailed, but which it is not necessary for me now to repeat. With these considerations as premises, he thought his government would make peace on the following conditions:

1st. Recognizing indemnization as the right of the victor in war.

2d. The indemnity due from Bolivia to Chili shall be fixed at a definite sum, and in default of payment, Chili shall be allowed to take Atacama; the fact shall also be recognized that, as a result of the war, a new demarkation of boundaries between the three nations has become necessary, and that the natural affinity of Atacama to Chili, arising from population and proximity, may be regarded in settling the demarkation.

3d. Bolivia desires, for the purpose of procuring a port upon the Pacific, to make an independent treaty with Peru by which, in exchange for Tacna and Arica, she would give the province of Caupolican, bordering upon Lake Titicaca and contiguous to Peru, and possibly would assume a portion of her debt or pay an additional compensation in money, the details to be hereafter arranged between the two countries.

Reverting to previous conversation, Señor Carrillo then inquired as to what I thought would be the attitude of my government upon the question.

I told him that I could not form an opinion; that it was within the bounds of possibility that Congress, to which body I understood that the question had been referred, might decide to withdraw altogether, or to intervene with effect; that I had no information or intimation on which to predicate an opinion; that, possibly, so indefinite a reply might be somewhat embarrassing to his government, but that a definite decision would, in all probability, be reached by the United States in a short time, and that it did not seem to me that a maintenance of affairs *in statu quo* for a limited period could seriously hamper or prove detrimental to Bolivia.

In this he concurred and informed me that he was accredited both to Chili and Peru, and, for the purpose of conferring with you and with the government of Peru, would gladly at once proceed to Lima, but was prevented from doing so for certain reasons. (See my dispatch numbered 2.) He also said that he was empowered by his government, on the understanding that the United States had entirely withdrawn from the question, to request the aid of the Argentine Republic, Brazil, or any other American power, and failing in this to request the intervention of Europe, and inquired of me what opinion my government would entertain of the latter course.

I replied that the traditional policy of the United States had ever viewed with disfavor European intervention upon this hemisphere, and that unless this policy had been radically overturned (of which I was not informed), it could not but view such a step with disfavor. This was the substance of our conversation.

I inquired of Señor Carrillo as to whether I was at liberty to refer to it in the conference which I hope to have in La Paz with Señor Zilveti, Bolivian minister of Foreign Affairs, to which he replied that, though he did not doubt that I would find Señor Zilveti's opinions to be identical, he preferred that the latter should express them voluntarily and spontaneously. I therefore take advantage of the mail, which I am informed leaves to-morrow for Callao, to send this for your guidance and information, and will report further after my return from La Paz.

I have concluded to go thither, and shall leave for Puno at six o'clock to-morrow morning. I have made arrangements which will, I trust, bring me to Mollendo on Monday or Tuesday next, and shall join you in Lima as quickly as possible. It seems to me to be more respectful to proceed to the Bolivian capital, and I cannot but think it extremely doubtful as to whether you will personally be able to go there.

There are some incidental questions as to the effect of the Balmaceda protocol in Bolivia and other matters touched upon in our conversation, to which I do not now deem it necessary to refer, but which I will hereafter explain to you, either orally or in writing.

I have written hastily, but I trust I have made myself intelligible, and that what I said and its results may meet with your approval.

I am, &c.,

WALKER BLAINE.

[Inclosure 2 in No. 1.—Translation.]

Señor Carrillo to Mr. Adams.

LEGATION OF BOLIVIA,
Arequipa, March 25, 1882.

SIR: The undersigned, Envoy Extraordinary and Minister Plenipotentiary of Bolivia accredited near the Government of Peru, is informed of the early arrival of Mr. Walker Blaine at the port of Mollendo, charged with a special mission from the United States, in order to have an interview with Your Excellency, and, as the distance prevents the Government of Bolivia from taking advantage of this opportunity to obtain some data necessary to the development of its policy, the undersigned takes the liberty of asking Your Excellency to please to make clear in the said interview the points contained in this letter.

In the protocol of the 11th of February last, signed by the Chilian minister of Foreign Affairs and His Excellency Mr. W. H. Trescot, Special Envoy Extraordinary and Minister Plenipotentiary of the United States of America, it is stated that "the mediation (of the United States) does not conform to the convenience of the belligerents, nor is it solicited by Chili," and it is added that, eliminating from all discussion the possibility of armed intervention, the United States "will offer its mediation only in case that the belligerents shall manifest a desire of obtaining it, and when its acceptance will conduce to results satisfactory to both." At the same time it is declared, in the third clause, that the *mediation of the United States is a point eliminated from all discussion and definitely concluded.*

Notwithstanding that the allied governments have shown by their official acts a respectful deference to the conciliatory policy of the United States, confiding in its efficacious influence for the restoration of peace, the declaration just recited leads one to consider that the new action upon which the government of Your Excellency entered, after the conference at Arica, in the present international conflict upon the Pacific, is definitely ended and withdrawn.

This consideration and the fact that no mention is made of the republic of Bolivia in the conference at Santiago, nor in the agreement signed at Viña del Mar, notwithstanding that, in consequence of the declarations made by your excellency in your respectful note of the 10th of January last, addressed to the Bolivian cabinet, all action was suspended until the result of the mission of Mr. Trescot should be made known, have determined the undersigned to interest Your Excellency in order that, in your approaching interview with Mr. Blaine, the reasons may, so far as possible, be made clear why Bolivia was not mentioned in the matters already referred to, and at the same time a declaration may be obtained as to the true meaning and extent of the conclusions of the aforesaid protocol relative to the mediation of the Government of the United States with regard to the three belligerent nations. The undersigned does not doubt that Your Excellency will entertain the present suggestion, as it will show the Government of Bolivia another proof of that delicate attention which Your Excellency has shown in the discharge of the duties of your high office.

With every consideration, &c.,

JOAN C. CARRILLO.

[Inclosure 3 in No. 4. Translation of inclosure 2.]

(Private copy.)

MINISTRY OF FOREIGN AFFAIRS OF BOLIVIA.

In the city of La Paz, on the 1st of April, 1882, in accordance with an agreement made the previous day, Mr. Walker Blaine with General Adams, minister resident of the United States, met Doctor Pedro José Zilveti, in the office of the minister of foreign affairs for Bolivia. The Minister commenced by asking Mr. Blaine what character they would give to the interview, to which he replied that he had instructions from the Plenipotentiary, Mr. Trescot, to ascertain the opinions and intentions of the Government of Bolivia, and that the conference would, therefore, be entirely confidential.

Señor Zilveti having signified his wish to know the extent and importance of the protocol of February 11th, signed by Messrs. Trescot and Balmaceda, Mr. Blaine made the same statements that he did, in reference to this matter, in his interview of March 28th with Señor Carrillo, stating, therefore, as a conclusion, that there was entire freedom of action for American diplomacy, in conformity with the friendly character of its relations towards the three belligerent nations. Señor Zilveti was permitted to ask Mr. Blaine what position the United States would take if Chili persisted in demanding the conditions of peace set forth in the protocol of the 11th of February, which on the part of Bolivia are absolutely inadmissible. The reply was as follows: The government of the United States sincerely desires the cessation of the actual war, but does not find itself in a position to itself assume a warlike attitude, because it does not desire to make

war, nor do the American people desire it; that for this reason, if the indicated conditions were not modified and the demand of cession of territory were maintained by Chili as the right of a conqueror and as a condition, *sine qua non*, of a settlement, the Government of the United States could do nothing more than to retire completely. (See foot note.) Señor Zilveti replied that he did not think that the point could be reached. That the United States would have to declare war against Chili, because one determined word from the former government would suffice to bring the conqueror to reason and make him consent to an equitable and satisfactory arrangement. He called attention, besides, to the fact that the retirement of the United States in such a case would make worse the condition of the allies and make another victory for Chili.

Señor Zilveti, being asked upon what base Bolivia would enter into an arrangement for the cessation of the present war which causes so much injury to the belligerents, replied, that, according to the conditions imposed by Chili, it would amount to a perpetual closing in of Bolivia, its deprivation of every outlet upon the Pacific, and its consequent death; that Bolivia could accept no such arrangement, preferring to indefinitely maintain a defensive attitude; but that, in his opinion, a preliminary arrangement for peace might be made, recognizing the right to a just indemnity, the mode and payment of which would be matter for a future international contract, the express declaration being made that the right of conquest was not recognized, and that this must be done without impairing the loyalty which Bolivia owes Peru, in accordance with their treaty of alliance.

Referring to the case of an absolute impossibility of arriving at any definite agreement, and of the wisdom of stipulating for an armistice or temporary truce, Mr. B aine asked on what conditions Bolivia would accept it. Señor Zilveti replied that he could not say with certainty what these conditions would be, but, as his own private opinion, he might say that, in the event of treating for a truce jointly with Peru, the war occupation should be limited to the department of Tarapacá and the littoral of Bolivia, a neutral zone should be determined, liberty and necessary guarantees given that Peru may be organized in a stable manner, and liberty of commerce accorded to Bolivia, through its own and Peruvian ports, in accordance with the existing treaties between the two nations. Señor Zilveti having asked if it was true that Mr. Trescot, in his special mission, expected new instructions from his government, and if they would be soon communicated, Mr. Blaine replied that they were actually expected, but that they could not be given until after the Congress of the United States, to which the question had been submitted for its consideration, should have passed upon it, and that he thought it improbable that this would be done immediately, since to obtain some exact information Mr. Hurlbut had been summoned home, and was to leave Lima on the 6th of April.

Referring to the mission of Señor Carrillo, with whom Mr. Blaine had conversed in Arequipa, Señor Zilveti stated that if Chili sincerely wished to enter into an arrangement leading to a solution of the present conflict, she would give Señor Carrillo a passport and the necessary guarantees that he might put himself in a communication with the Government of Peru, to which he has been accredited. Mr. Blaine said that he thought so too, and had, on his part, addressed Mr. Trescot from Arequipa, recommending him to obtain from the Chilian authorities all the guarantees wished for, that Señor Carrillo might proceed to the fulfillment of his mission.

Here the confidential interview, of which this is a brief summary, ended.

Approved.

JENARO SANJINES,
Chief Clerk of Foreign Affairs.

NOTE.—The statement made by me was that, in the present complicated condition of affairs, Chili would not yield her claim to the cession of Tarapacá, unless compelled to do so by a manifestation on the part of the United States of a purpose to force her to that determination; that neither the people nor the Government of the United States had ever contemplated the possibility of assuming a warlike attitude.

W. BLAINE.

No. 37.

Mr. Trescot to Mr. Frelinghuysen.

[Telegram.]

LIMA, *May* 12, 1882.

FRELINGHUYSEN, *Washington:*

Will leave upon the Lackawanna on 14th, Panama 24th. Admiral of the fleet requests you will inform Secretary of the Navy.

TRESCOT.

No. 38.

Mr. Trescot to Mr. Frelinghuysen.

No. 26.] SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Washington, D. C., June 5, 1882.

SIR: In dispatch No. 24, dated Lima, May 3, 1882, I inclosed an account of my interviews with Señor Alvarez, the Peruvian Secretary for Foreign Affairs, and the letter which in consequence I addressed to the Chilian Government.

The purpose of that letter was to urge upon the Chilian Government the acceptance of the preliminary conditions which the Peruvian Government thought necessary to the initiation of a serious negotiation for peace.

The conditions were:

1. That General Montero should be recognized as the executive head of an actual government.

2. That, under the provisions of a short truce, he should be afforded the opportunity to convene the National Congress at Arequipa, in order that he might receive from it the authority necessary for the conclusion of a peace.

My reasons for the representation made to the Chilian Government in this connection have been so fully stated in my dispatch to the Department, and in the communication to the Chilian Government, that they need not now be repeated.

It only remains for me to state what consideration has so far been given to the proposed conditions.

For reasons which have been stated in former dispatches, I was obliged to leave Lima before my communication in its formal shape could reach the Chilian Government at Santiago. But that government has in Lima a diplomatic representative in the person of Señor Novoa, who is authorized to consider any propositions tending to a negotiation for peace.

The whole subject was fully discussed with him and General Lynch, the military commander of the Chilian army of occupation, and the propositions, with the substance of the conference, were telegraphed by Señor Novoa to his government.

I do not regard the telegraphic reply which was communicated by Señor Novoa as conclusive. My dispatches had not yet reached the Chilian Government, and I think it clear that the bare statement of the propositions had not put the Chilian Government in full possession of the considerations which recommended their adoption. I have other reasons for believing that the question is still an open one.

The reply of the Government of Chili, as communicated by Señor Novoa, intimated:

1. That as no active military operations were being conducted by the Chilian army, there were was no apparent necessity for a truce. But it is obvious that, as Arequipa is open at any moment to occupation by the Chilian troops from Mollendo, the Peruvian Congress would naturally and properly require some guaranteethat its deliberations should be free and uninterrupted. A repetition of the dissolution of Congress because its deliberations were not agreeable to the Chilian Government, is a contingency which the Congress, in view of the past, could scarcely disregard, and which would make any effort at negotiation only another unfortunate failure. Beside which, if there are, and are to be, no active

military operations, there can be no possible danger or inconvenience to Chili in giving such a condition of things the sanction of a formal agreement by a short notice.

2. While the Chilian Government desired peace, it was unwilling to enter upon negotiation without distinct agreement in advance of the terms which must be accepted. It was dissatisfied with the experience of its former attempts at negotiation with the Calderon government and was indisposed to renew the effort without the certainty of a successful result. It was willing, therefore, to negotiate informally with General Montero, and upon the signature of satisfactory preliminaries would recognize the existence of the Peruvian Government, *pari passu*, with the execution of the treaty.

But the Congress which had authorized General Montero to negotiate had expressly forbidden any cession of territory, and it was, therefore, simply impossible for General Montero to sign a treaty containing such provisions. After some discussion Señor Novoa expressed his willingness to accept a preliminary agreement by which General Montero would bind himself to submit for approval, to the national Congress, such a treaty as he and Señor Novoa could agree upon, and to recognize Geueral Montero's government upon the execution of such an instrument. This would have afforded an opportunity for the opening of negotiations, but Señor Novoa added the limitation that if the Congress did not approve the treaty so submitted, the recognition would be withdrawn. This was simply an impossible condition. The recognitiou of the Montero government had to be positive. If Congress failed to approve, Chili could still prosecute the war until Peru was compelled to accept her terms, but such a contingent recognition was in fact only the old proposition of a treaty before recognition in another and much more illogical and embarrassing shape. Señor Novoa was willing to adopt another method. He would sign a treaty with General Montero to be submitted and approved by the municipalities, that is, by the local authorities of the separate provinces. Such a method was entirely beyond General Montero's constitutional powers and would, I think, have led to the renewal of the differences between the various parties in Peru, who, accepting General Montero as the legitimate representative of the government, would acquiesce in the regular action of the Executive and Congress.

As Señor Novoa was either indisposed or unauthorized to move out of this vicious circle, our conferences terminated.

I regret this the more as I think the propositions offered a fair prospect of a serious negotiation. Chili cannot obtain a peace which will give sanction and title to her acquisition of territory without the recognition of a legitimate government in Peru. Without a treaty with such authority the acquisition will be simply one of force to be maintained as it has been acquired. The recognition of General Montero's government will place upon him, and upon the people of Peru, the responsibility of making or rejecting peace while the calling of Congress will afford the opportunity to those who desire peace to do what they cannot do under present circumstances; organize a party which can exert its influence directly, effectively, and legitimately in the Congress itself.

But I cannot with justice conclude this dispatch without saying that I believe the reason which induces the hesitation of Chili is that she believes that, so long as the Peruvians are convinced that the United States will finally intervene, they never will negotiate in earnest.

It is unquestionably true that the Peruvian Government does believe that the United States will intervene; at any rate they consider that the question of intervention, as one of their leading officials expressed it to me, was still a pending question.

It is obvious that neither Chili nor Peru will approach the solution of their difficulties in the proper spirit, or with any hope of a result satisfactory to both, as long as this impression lasts.

If the United States intend to intervene effectively to prevent the disintegration of Peru, the time has come when that intention should be avowed. If it does not, still more urgent is the necessity that Chili and Peru should understand exactly where the action of the United States ends. It would be entirely beyond my duty to discuss the character or the consequences of either line of conduct, but I trust that you will not deem that I am going beyond that duty in impressing upon the government that the present position of the United States is an embarrassment to all the belligerents, and that it should be terminated as promptly as possible.

There is another conviction which it is clearly my duty to express. I believe that whenever the United States formally withdraws from further intervention Peru will apply to the European powers, and that a joint intervention of two or more is probable. It is not for me to anticipate what view the Department will take of such a possibility.

I have, &c.,

WM. HENRY TRESCOT.

No. 39.

Mr. Trescot to Mr. Frelinghuysen.

No. 27.] SPECIAL MISSION OF THE UNITED STATES IN SOUTH AMERICA,
Washington, D. C., June 10, 1882.

SIR: I herewith inclose a copy of a communication just received from Señor Alvarez, Secretary for Foreign Affairs of the Provisional Government of Peru, and have the honor to be your obedient servant,

WM. HENRY TRESCOT.

[Inclosure in No. 27.—Translation.]

HUARAZ, *May* 10, 1882.

Mr. MINISTER: The representatives of Your Excellency's government in Peru, and those of the government of this country, have on various occasions informed your government of the cruelty and the act of vandalism with which the Chilian forces carry on hostilities against our defenseless people. The recital of a portion of these acts of barbarity has now been published, being contained in the volume of official documents published by Your Excellency's government, in relation to the war on the Pacific coast. The Hon. Mr. Christiancy, in giving an account of these acts, refers to them with deep emotion. I will quote a few passages from his communications:

"Last week a Chilian force of from two to three thousand men marched from Ilo to Mollendo, and with some marines who were near, or who arrived there about that time, they completely burned, sacked, and destroyed the town, railway and railway station, wantonly destroying the lives of peaceable inhabitants."

"The orders given by the Chilian Government to their fleet to destroy all the Peruvian ports can hardly be carried out without great inhumanity and even barbarity, and that towards neutrals." (March 23, 1880, page 325.)

Referring to other outrages, he says:

"This mode of carrying on the war by Chili has produced a strong feeling here among all the representatives of foreign powers.

"I shall readily join in protesting against all such means as are supported only by savage or semi-barbarous practices of past ages, but condemned by the more humane codes of modern warfare. Humanity has some rights even higher than those of belligerents.' (March 24, 1880, page 327.)

"This is not war, but deliberate, wholesale murder, unprovoked by anything yet done by the allied forces, and, in the cause of civilization and humanity, calls for an indignant protest from all civilized nations." (July 5, 1880, page 330.)

"If Chili chooses to employ savages as soldiers she must be held responsible before the world for all such excesses as would not have been committed by a civilized soldiery under proper discipline." (February 2, 1881, page 438.)

Your Excellency sees for yourself in the vicinity of Lima the traces of this barbarous warfare.

It now becomes my painful duty to call Your Excellency's attention to a fresh outrage of this kind, which has just been committed in the province of Jauja by the Chilian forces which are overrunning that territory.

The commander of those forces, whose name is E. del Canto, sent on the 6th of April last an artful communication to various towns in that province, telling them that the Chilian forces had not come for the purpose of making war upon the poor, but upon the rich, so as to compel them to sue for peace. (Inclosure No. 1.)

The object of this communistic proclamation was to induce the Indians to plunder the property of the wealthy classes in order that the Chilian forces might thus be supplied with beef cattle. To this wily missive intimidation was added, Mr. del Canto informing the Indians that he had caused their principal men in those districts to be placed under arrest.

Finding that his insinuations were of no avail, del Canto proceeded to commit an act of the most barbarous cruelty. He invaded those defenseless villages with a force of two thousand men and butchered the inhabitants, without sparing either age or sex. He drove those who escaped the murderous knife to the mountains, thus depriving them of shelter and of every means of subsistence. (Inclosure No. 2.)

The inclosed copies of reports received by the government will give Your Excellency a fuller view of these horrors. These copies are not authenticated, because the parties who sent them feared the evils to which they would have been subjected if the papers had been intercepted.

It seems scarcely credible, the war being *de facto* at an end, for the simple reason that Peru is unable to continue it, and in presence of Your Excellency's mission of peace, that such acts of atrocity are possible.

Your Excellency will observe that this officer, del Canto, molds the policy of his government in the most inhuman manner.

The revelation of such cruel proceedings and of such wicked purposes will, I hope, be an additional incentive to Your Excellency's government to increase its laudable efforts to bring about a peace without usurpations on the part of Chili. It is not possible that Your Excellency's government should witness unmoved the execution of this horrible design: "Either the conquest of a portion of our territory or the butchery of its inhabitants." It cannot be that these atrocities are to go on year after year before the very eyes of the United States in spite of their denunciation by the Hon. Mr. Christiancy

In the mean time I likewise hope that Your Excellency, with the sense of justice which characterizes you, will for the honor of humanity endeavor, so far as you are able, to put an end to these revolting deeds.

With sentiments of the most distinguished consideration, I am, &c.,

MO. ALVAREZ.

[Inclosure No. 1.]

No. 108.] HUANCAYO, *April* 6, 1882.

To the chief of the communities of Vinca, Moya, Cocra, Laran, and others on the heights of Chongos:

The Chilian forces have not come to make war upon or to oppress the poor. The sole object of their coming has been to compel the rich to sue for that peace which is so necessary in order that the poor may be able to pursue their labors without molestation.

In view of the fact that the Chilian forces have been living almost at the expense of the poor, and as the Government of Huancayo was badly disarranged, the notables have been placed under arrest.

What is desired is that the rich should give what they ought; consequently, the chief of the communities on the other side is requested to send commissioners to the

principal estates for the purpose of bringing beef cattle, so that those which have been taken from the poor may be restored to them, and that some may be left for the subsistence of the Chilian forces.

The chief of the communities is further requested to inform his people that they may retire to their villages with the certainty that the Chilian forces will do them no harm.

A reply is requested.

God guard you.

E. DEL CANTO.

COMMUNICATIONS FROM MR. WALKER BLAINE TO THE DEPARTMENT OF STATE.

No. 40.

Mr. Walker Blaine to Mr. Blaine.

Separate. Unnumbered.

PANAMA, UNITED STATES OF COLOMBIA, *December* 12, 1881.

SIR: I have the honor to acknowledge the receipt of a cable dispatch informing me that the President has been pleased to designate me as chargé d'affaires in Chili, pending the arrival of a new minister to fill the vacancy occasioned by the death of the late minister, General Kilpatrick, and stating that credentials and instructions were mailed from Washington on Friday last.

I am also requested by Mr. Trescot, envoy extraordinary, &c., to acknowledge to you the receipt by him of cable message, in which the same information is given him, and in which he is requested to proceed to Santiago with as little delay as possible.

We are at present waiting at this point until the U. S. steamer Lackawanna shall be supplied with coal, and shall proceed with all possible speed immediately thereafter to Santiago.

The captain of the Lackawanna to-day informed Mr. Trescot that he hoped to leave this port to-morrow, or, at latest, on Wednesday next, and that the voyage to Valparaiso could not in all probability be made in less than twenty-five days, as he would be obliged to stop at Callao to replenish the supply of coal. This calculation would indicate some day between the fifth and tenth of January next as the probable date of arrival in Santiago.

Mr. Trescot desires me to say that he shall proceed with all possible expedition to Chili, and that while for the reason above given he is not able to avoid putting in at Callao, he will exercise every precaution to avoid embarrassing the success of his mission by such action.

As it will be impossible for the instructions forwarded to me from the Department of State, and without which I cannot act as chargé d'affaires at Santiago, to reach that city before the tenth of January next, I think I can safely assure you that I shall be in Santiago in advance of my instructions.

As I am further informed by your cable message that the duties of chargé d'affaires will not prevent me from aiding Mr. Trescot in the special mission, I shall be governed by his wishes and commands, unless further instructions from the Department should countermand those issued to me before my departure from Washington.

I am, sir, &c.,

WALKER BLAINE,
Third Assistant Secretary of State.

No. 41.

Mr. Walker Blaine to Mr. Frelinghuysen.

No. 1.] LEGATION OF THE UNITED STATES,
Santiago de Chili, January 13, 1882.

SIR: I have the honor to announce my arrival at Valparaiso, Chili, on Wednesday, the 4th instant, and at Santiago (the two days intervening having been spent in Valparaiso) on Saturday, the 7th of January.

I received on Tuesday evening a letter from the Secretary of State (Mr. Blaine) instructing me to take charge of this legation until the arrival of a new minister, and inclosed therewith a letter addressed to the minister of foreign affairs of this republic, accrediting me as chargé d'affaires of the Government of the United States. The latter I presented on Wednesday last (January 11) to Señor Balmaceda, secretary of state for foreign affairs for this government, and I have to-day been verbally informed by Mr. Balmaceda that the Chilian Government recognizes me in that capacity.

When at Valparaiso, Mr. Foote, consul of the United States at that port, delivered to me certain correspondence addressed to General Kilpatrick, late United States minister to Chili, of which he took possession after the death of the latter, as well as certain instructions from the Department of State received after the death of General Kilpatrick. I also received from Mr. Foote the cypher of the Department of State, belonging to this legation, for which proper receipt is herewith inclosed.

Upon arriving at Santiago, Mrs. Kilpatrick gave to me the instructions received by her husband, as well as the seal of the legation, the keys to the rooms now occupied as such, and divers other articles, the property of the legation of the United States in Chili. I shall transmit by next mail a full inventory of all the property found by me in the legation of the United States in this city.

I have the honor to acknowledge the receipt at this legation of instructions addressed to Mr. Osborn, numbered 134 and 135. From General Foote, consul at Valparaiso, I received instructions addressed by the Department of State to Mr. Kilpatrick, numbered 11, 12, 13, 14, 15, and 16. These instructions had not been opened up to the time of my arrival, having been received after the death of our late minister. By the mail received Wednesday came Department's instruction No. 17, under cover to Mr. Kilpatrick, and received and opened by me. From Mrs. Kilpatrick I received Department's instructions addressed to Mr. Kilpatrick, numbered 2, 3, 4, 5, 6, 7, 8, and 9. It will thus be seen that instructions from the Department of State to Mr. Kilpatrick numbered 1 and 10 are missing, and in order to render complete the archives of the legation, I respectfully request to be furnished with certified copies of the same.

In the book containing copies of Mr. Kilpatrick's dispatches to the Department of State I do not find copy of his dispatch numbered 1. I respectfully request to be furnished with a copy of this dispatch, that I may cause it to be transcribed in the records of the legation.

I beg to call the attention of the Secretary of State to one other matter. At the time that Mr. Trescot was sent upon the present mission it was deemed advisable to send me with him, as it was thought that it might be necessary to conduct negotiations at more than one

point at the same time. Since my departure, the death of Mr. Kilpatrick having occurred, the Department has been pleased to direct me to act as chargé d'affaires until the arrival of Mr. Kilpatrick's successor. I suppose that it is deemed inadvisable to send out a new minister until after the completion of Mr. Trescot's special mission. Should such be the case, it would naturally happen that no minister would arrive at this place until some two months after the departure of Mr. Trescot. I venture therefore to suggest to the Department that I be given permission, should no unforeseen complication arise, to place the archives in the hands of our consul at Valparaiso, and to return to the United States upon the conclusion of the special mission of Mr. Trescot. I cannot but think that I can by that time have so far completed the current business of the legation as to render it practicable for me to return without endangering or delaying the affairs of the United States in this country, and I do not desire to be absent for longer time than shall be necessary from my desk in the Department.

In this connection I beg to state that I do not desire, even if permissible, to receive compensation as chargé d'affaires of this legation. I shall draw before my departure from Chili, for the ordinary disbursements of the legation, to be charged to the account of incidental expenses, for which an allowance is made by the Department of State at the rate of four hundred dollars per year.

Deferring until the departure of the next mail a more detailed account of the condition and business of this legation.

I have, &c.,

WALKER BLAINE.

No. 42.

Mr. Walker Blaine to Mr. Frelinghuysen.

No. 2.] LEGATION OF THE UNITED STATES,
Santiago de Chili, January 20, 1882.

SIR: Referring to Department's instruction No. 134, dated July 14, 1881, and addressed to Mr. Osborn, I beg to state that on the 17th day of September, 1881, Mr. John F. Van Ingen was recognized by the Chilian Government as consul at Talcahuana, Chili. I do not find from the record of dispatches forwarded by Mr. Kilpatrick that the Department has been so informed, and on that account forward this information.

Referring to the instruction of the Department numbered 13, dated November 22, 1881, and addressed to Mr. Kilpatrick, but never received by him, I have the honor, in accordance with the suggestion of said instruction, to forward herewith a copy of Mr. Balmaceda's note of October 8, 1881, to Mr. Kilpatrick, and a translation of the same.

I had hoped to be able to forward by this mail, as I indicated in my dispatch of the 13th, a full inventory of the property of the legation in this city, but am unfortunately obliged to postpone doing so until the next mail. It appears that from the time of his arrival at this post, until his death, Mr. Kilpatrick was a constant sufferer from severe illness, and owing to this a large amount of the current business of the legation, of practically slight importance however, was left undone. I have occupied myself during the past week with this and with aiding Mr. Trescot in such manner as he desired, and have not therefore been able to forward the inventory.

For the information of the Department, I transmit by this mail two copies of the report of the Chilian minister of foreign affairs to the Congress of 1881. They will be found to contain, among other matters of interest, a full report of the settlement of the boundary question with the Argentine Republic, with the correspondence relating thereto, a settlement in which our ministers here and at Buenos Ayres materially aided.

I have, &c.,

WALKER BLAINE.

[Inclosure 1 in No. 2.—Translation.]

Señor Balmaceda to Mr. Kilpatrick.

REPUBLIC OF CHILI, MINISTRY OF FOREIGN AFFAIRS,
Santiago de Chili, October 8, 1881.

SIR: The newspapers of Valparaiso and of this capital have published the memorandum which Mr. Hurlbut, the minister of the United States in Lima, on the 24th of August, of this present year, addressed to the chief of our army of occupation in that city, Rear-Admiral Lynch. The letter that your excellency knows of, and which Mr. Hurlbut inclosed with the memorandum, in which said gentleman commenced by saying to Rear-Admiral Lynch that in the conversation referred to in the memorandum, *he did not treat of diplomatic business*, has not been published with the memorandum.

My government has thought proper to call your attention to the irregularity of this conduct, attaching little importance to it in reality, as it is confident that the declarations contained in the memorandum are not the expression of the circumspect, noble, and loyal policy which the Government of the United States has observed toward the belligerents of the Pacific.

The strange publicity given to a document of very little confidential importance, taking into consideration the manner and circumstances under which it was produced, obliges me to address myself to you in order to obtain an answer that may officially establish the truth and sincerity of the relations that our respective governments so worthily cultivate.

The speech which Mr. Hurlbut made when presenting his credentials to the government of Garcia Calderon, now extinct, the *memorandum* addressed to Mr. Lynch when *he did not treat of diplomatic business*, his well known letter against Pierola, to whom Mr. Christiancy was accredited, and whose plenipotentiaries held a conference in Arica in the presence and with the full consent of the representatives of the United States, may produce deplorable confusion and give useless hopes to the enemy or stimulate them to a resistance fruitless for the results of the struggle, and in any case bloody.

Chili provoked to war, the property of its citizens confiscated and they inhumanly turned out of their homes, its industry destroyed by the thousands of hands that have left it, preferring to vindicate their rights and their honor; the very large sums employed for the maintenance of the struggle; the pricless blood of its sons spilt; the enemy routed, and on sea and land reduced to absolute and radical impotency, we will carry the war as far as it may be necessary to oblige the conquered to sign a peace; and in the settlement of peace, we will go, exercising our sovereignty, as far as it may be necessary to obtain the reparation due for the evils produced by the war, the future security in peace, and the permanent stability of the republic.

We will exercise, in all its fullness, the primitive right that authorizes us to fully guarantee our existence—a right continually confirmed by the practice of European powers and of the United States themselves—in America.

I am confident that our rights as a belligerent will be respected by the United States as much in the future as they have been up to this time. The conduct of its representatives in Arica and all through the war, its friendly participation in the treaty that ended the question of boundary with the Argentine Republic, its worthy international traditions, and the respect which, as a powerful nation, it owes especially to independent and sovereign states, perfectly assure me that the United States will continue performing its friendly acts if it wishes, but will always remain friendly neutrals in the obstinate war that we are sustaining with our enemies of the Pacific.

Since motives foreign to the will of my government have created in the public mind a state of uncertainty that may be misunderstood, and therefore occasioning disagreeable incidents in the difficult circumstances that the state of war may cause among the belligerents, I hope from your excellency the assurance that, in conformity with your instructions, you can give to my government about the reciprocal good under-

standing that exists, and which will be maintained unchangeable between the republics that we have the honor to represent.

It is grateful to subscribe myself, with feelings of the highest esteem and consideration for your excellency, your attentive and obedient servant,

J. M. BALMACEDA.

No. 43.

Mr. Walker Blaine to Mr. Frelinghuysen.

No. 7.] LEGATION OF THE UNITED STATES,
Viña del Mar, Chili, February 3, 1882.

SIR: Referring to Department's instructions numbered 15 and 17, addressed to Mr. Kilpatrick, I have the honor to inform you that, in accordance with the permission given in a letter received from Mr. Trescot, a copy of which you will receive as an inclosure to his dispatch numbered 8, I availed myself of the interview appointed by Mr. Balmaceda, secretary of state for foreign affairs, with Mr. Trescot, and, with the latter's permission, accompanied him to Mr. Balmaceda on Tuesday last, the 31st ultimo.

After some remarks upon other topics by Mr. Balmaceda, Mr. Trescot stated to him the object for which I had come, saying to him:

You are doubtless aware, sir, of the friendly interest which the United States has for some time manifested in endeavoring to procure a concerted system of action on the part of the powers of the western continent which might lead to some united policy on their part tending to the perpetuation of peace, the avoidance of international wars, and possibly the settlement of disputed points by arbitration. During the past year the United States has been appealed to by Guatemala to exert its good offices in settling the question of boundary existing between Guatemala and the neighboring Republic of Mexico; it has been requested by Venezuela to assist her in regulating the question of her debt to foreign countries, and I venture to also call to your recollection the happy influence exerted by our ministers to Chili and to the Argentine Republic in aiding the two governments to harmoniously decide a question of boundary, which seemed, at one time, to threaten serious consequences. I mention these facts as showing the spirit in which the United States proffers the invitation, for the purpose of presenting which on the part of his government Mr. Blaine has accompanied me this morning. The invitation is dated in November, 1881, and the date of the congress is fixed for November of the present year. I desired, however, before permitting the presentation of the invitation to Chili, to make sure that the invitations to Bolivia and Peru were presented to those governments at the same time, as, if such an invitation should be presented to one government and not to either of the others, such a fact might, in the present condition of affairs between the three republics, lead to misunderstanding. The letter addressed to General Adams, instructing him to invite the Government of Bolivia, was among the intercepted dispatches which came into my hands last week. As I am now assured that the letter will reach General Adams, and, as I am informed that Mr. Hurlbut has received the invitation for Peru, I have told Mr. Blaine that I thought it best that the invitation should now be given to your government. That the proposed congress has no bearing upon the question of existing hostilities you will see when Mr. Blaine shall have read to you the invitation.

To this Mr. Balmaceda replied:

The subject of a conference of American nations, both including and without the United States, has been brought to the attention of my government by the United States of Colombia some time since, and on other occasions. My government has never yet decided as to what course it would pursue with reference to such matters, and I cannot give any answer without first consulting my government. May I ask what is the full purpose of this congress.

To this Mr. Trescot replied that no answer would at this time be expected from the Government of Chili that I was prepared to leave a copy of the invitation; that the government might take the question

into consideration, and that the question as to the object of the proposed congress would be best answered by permitting me to read the invitation.

This I was about to do, when Mr. Balmaceda said:

> It would, perhaps, be better not to deliver the invitation, as I have received telegraphic information that the Government of United States has abandoned this proposed congress—

and then went on to give further details of his knowledge as to the action of the United States, which it is unnecessary for me to repeat, as they referred to other matters, and are fully set forth in Mr. Trescot's dispatch of this date, numbered 8.

I could not but think that it was possible that the secretary might have been misinformed, but concluded that it was best not to further press the matter. The fact that the United States had proposed such a congress had been brought to his attention, and if, Mr. Balmaceda's information proving incorrect, I should hereafter be instructed to deliver the invitation, the delay in delivering it cannot create embarrassment, as I have desisted from now delivering it at his own request.

Awaiting your further instructions with regard to this subject, I have, &c.

WALKER BLAINE.

No. 44.

Mr. Walker Blaine to Mr. Frelinghuysen.

No. 8.] LEGATION OF THE UNITED STATES,
Vina del Mar, Chili, February 24, 1882.

SIR: Referring to my dispatch numbered seven, dated February 3, 1882, with regard to the presentation of the invitation to the President of the Republic of Chili to send two delegates to a Congress of the American powers, to be held in Washington, in the month of November next, I have the honor to inform you that on the 22d instant I waited upon Señor Balmaceda, Chilian secretary of foreign affairs, and read the invitation to him, stating to him at the same time what arrangements the Government of the United States proposed to make to facilitate the labors of the congress, a statement which I afterward embodied in a memorandum note addressed to him, a copy of which is herewith inclosed.

So many erroneous statements as to the object of the proposed congress, translations among others of articles published in the United States, were being constantly circulated in Chili, that it appeared to me that possibly unfortunate impressions as to the purpose and attitude of our government might be created. I was also well assured that the invitation had been presented to every government in South America except Chili. I telegraphed on the 13th instant to Mr. Osborn, our minister resident near the Argentine Republic, inquiring as to whether he had received the invitation referred to, and, if so, what disposition he had made of it, and he replied that he had received the invitation and at once presented it to the government to which he is accredited. I awaited the receipt of the mail of the 21st instant, and, receiving no instructions upon the subject, thought it best, under the circumstances, to present the invitation.

Mr. Balmaceda informed me that he would be pleased to consider the invitation as having been presented at the earlier date, when I made the attempt to do so, but at his request desisted; that the laudable purpose for which the congress was invited could not but meet the approval of all nations, and that he would transmit the reply of his government at as early a date as should be practicable.

Trusting that my action will meet your approval,

I have, &c.,

[Inclosure in No. 8.]

Mr. Blaine to Señor Balmaceda.

LEGATION OF THE UNITED STATES,
Vina del Mar, Chili, February 22, 1882.

SIR: In transmitting, at your request, a copy of the invitation of the President of the United States to his excellency the President of the Republic of Chili to send representatives to a congress of the nations of North and South America, which it is proposed to hold in Washington in the month of November next, I beg to furnish to your excellency some indication of the arrangements which my government proposes to make to facilitate the labors of the congress.

I am instructed to say that it is designed that the congress shall be held under the auspices of the Government of the United States, which, to that end, will supply a suitable hall for the meetings of the commissioners, will take charge of all the necessary arrangements, and, at its own expense, will meet all the material requirements of the congress, reporting and interpreting the proceedings and printing the resultant protocols in Spanish and English for the use of all the parties. Secretaries, clerks, and copyists in both languages will be provided and paid by the United States—no expense being left to the invited countries except the maintenance of their own commissioners.

I avail, &c.,

WALKER BLAINE.

No. 45.

Mr. Walker Blaine to Mr. Frelinghuysen.

No. 13.] SPECIAL MISSION OF THE UNITED STATES
IN SOUTH AMERICA,
Lima, Peru, May 10, 1882.

SIR: I have the honor to acknowledge the receipt this day of your instructions, numbered one, two, and three, which have been forwarded to me from Chili.

I have communicated by letter to Señor Aldunate, Secretary of State for Foreign Affairs of Chili, the appointment of Mr. Logan, and have informed Rear-Admiral Balch of your appreciation of his action in receiving on board the flag-ship Pensacola the shipwrecked Japanese sailors.

As it is my present intention to depart on Saturday next for the United States, I have forwarded your dispatches to Mr. Foote, that they may be filed among the archives of the legation, and, in accordance with diplomatic usage in Chili, have communicated the notice of my departure to the Chilian secretary of state for foreign affairs.

I have, &c.,

WALKER BLAINE.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 182.

LETTER

FROM

THE SECRETARY OF THE INTERIOR,

TRANSMITTING,

In response to Senate resolution of March 24, 1881, a list of all books, reports, documents, and pamphlets printed or published by this department from 1789 to 1881.

JUNE 14, 1882.—Ordered to lie on the table and be printed.

DEPARTMENT OF THE INTERIOR,
Washington, June 13, 1882.

SIR: I have the honor, in compliance with a resolution of the Senate, adopted March 24, 1881, to submit herewith a list, as nearly complete as can now be supplied, of all books, reports, documents, and pamphlets printed or published by this department and its several bureaus and offices from the date of its organization, and in the care of the Patent and General Land Offices from 1789 to 1881.

Very respectfully,

H. M. TELLER,
Secretary.

The PRESIDENT *pro tempore*,
of the United States Senate.

LIST OF BOOKS, REPORTS, DOCUMENTS, AND PAMPHLETS PUBLISHED BY THE DEPARTMENT OF THE INTERIOR, AND ITS SEVERAL BUREAUS AND OFFICES.

OFFICE OF THE SECRETARY.

Annual Report Secretary of the Interior. Pamphlets. 1849 to 1880 (inclusive).
Annual Report Secretary of the Interior, and accompanying documents. 1849 to 1880.
Report on Colonization. Pamphlet. 1862.
List of Emigrants. Pamphlet. 1863.
"Supplemental Report of Chief Engineer and General Superintendent of Washington Aqueduct". Pamphlet. 1864.
Annual Report of Lieut. Col. J. H. Simpson to the Secretary of the Interior. Pamphlet. 1865.
Report of proceedings Board Government Directors, Commissioners, and Engineer Union Pacific Railroad. Pamphlet. 1866.
Report on the Pacific Railroad. 1869.

Letter of Secretary of Interior, March 7, 1870, and accompanying documents, in answer to House resolution relative to Piegan Indians. 1870.
Message of the President and letter of Secretary of Interior relative to Indian Affairs. 1870.
Report on completion of Pacific Railroad.
Catalogue of Department Library. Pamphlet. 1871.
Decision of Secretary of the Interior and opinion of Assistant Attorney-General in the matter of the Osage ceded lands. Pamphlet. 1872.
Catalogue of Department Library. Pamphlet. 1873.
Report of Commission appointed by Secretary of Interior to investigate certain charges against Hon. E. P. Smith, Commissioner of Indian Affairs. Pamphlet. 1874.
"What the Government and Churches are doing for the Indians." Pamphlet. 1874.
Reports of Commissioners who examined the Central and Union Pacific Railroads in 1869 and 1874, and letter of Secretary Cox to Commissioner General Land Office. 1874.
Report of the Icelandic Committee, &c. Pamphlet. 1875.
Catalogue of Department Library. 1875.
Report of Committee appointed by Secretary of Interior to test the relative merits of certain Gas Governors. Pamphlets. 1875.
Pamphlet relating to charges of Prof. O. C. Marsh of fraud and mismanagement at the Red Cloud Agency. Pamphlet. 1875.
Register of Department of the Interior, 1877. 1877.
Report of Government Directors of the Union Pacific Railroad. 1878.
Report of Hot Springs Commission. 1878.
Report of Sitting Bull Commission. 1878.
Report of Superintendent Yellowstone National Park. 1873.
Report of Superintendent Yellowstone National Park. 1878.
Report of Hot Springs Commission. 1879.
Report of Government Directors of the Union Pacific Railroad. 1879.
Report of Superintendent Yellowstone National Park. 1879.
Register of Department of the Interior. 1879.
Report of Government Directors of the Union Pacific Railroad. 1880.
Report of Commissioners and Engineers of the Hot Springs. 1880.
Report of Superintendent Yellowstone National Park. 1880.
Pamphlet containing papers relative to the "Ute outbreak." Pamphlet. 1880.
Report of the United States Inspector of Gas Meters, 1880. Pamphlet. 1880.
Report of Engineer and Architect reconstruction Patent Office building. Pamphlet. 1880.
Catalogue of Department Library. 1880.
Annual Report Columbia Institution for Deaf and Dumb. Pamphlet. 1858–'80.
Pamphlet concerning Collegiate Instruction, Columbia Institution for Deaf and Dumb. Pamphlet. 1868–'69.
Annual Report Columbia Hospital for Women and Lying-in Asylum. Phamphlet. 1866–'79.
Special Report Columbia Hospital for Women and Lying-in Asylum. Pamphlet. 1873.
Annual Report Freedmen's Hospital. Pamphlet. 1874–'80.
Annual Report Architect of the Capitol (excepting 1853 to 1861). Pamphlet. 1851–'80.

Annual Report Government Hospital for the Insane. Pamphlet. 1854–'80.
Annual Report Commissioner of Railroads. Pamphlet. 1878–'80.
Annual Report Reform School of District of Columbia. Pamphlet. 1866–'73.
Annual Report Board of Metropolitan Police (inclusive). Pamphlet. 1861–'72.
Annual Report Commissioner of Public Buildings (inclusive). Pamphlet. 1855–'66.
Annual Report Warden of the Jail (inclusive). Pamphlet. 1854–'71.
Annual Report Chief Engineer Washington Aqueduct (inclusive). Pamphlet. 1862–'65.
Annual Report Engineer Potomac Water Works (inclusive). Pamphlet. 1859–'60.
Annual Report Board Indian Commissioners (inclusive). Pamphlet. 1868–'80.
Report of the Surveyor-General of Illinois. Pamphlet. 1852.
Report of the Surveyor-General of Missouri. Pamphlet. 1852.
Report of the Surveyor-General of Oregon Territory. Pamphlet. 1852.
Report of the Surveyor-General of Wyoming Territory. Pamphlet. 1879.
Report of the Surveyor-General of Washington Territory. Pamphlet. 1879.
Report of the Surveyor-General of Idaho Territory. Pamphlet. 1879.
Report of the Surveyor-General of Arizona Territory. Pamphlet. 1879.
Report of the Surveyor-General of Dakota Territory. Pamphlet. 1879.
Report of the Surveyor-General of Montana Territory. Pamphlet. 1878–'79.
Report of the Governor of Montana Territory. Pamphlet. 1878–'79.
Report of the Governor of Washington Territory. Pamphlet. 1878–'80.
Report of the Governor of Wyoming Territory. Pamphlet. 1878–'80.
Report of the Governor of Arizona Territory. Pamphlet. 1878–'79.
Report of the Governor of Dakota Territory. Pamphlet. 1878–'80.
Report of the Governor of New Mexico Territory. Pamphlet. 1879.
Report of the Governor of Idaho Territory. Pamphlet. 1878–'80.
Report of the Governor of Utah Territory. Pamphlet. 1878–'80.

PATENT OFFICE.

Annual Reports 1790 to 1836. 1 vol. Photographed from original documents.
Annual Reports 1837 to 1842 inclusive.
Annual Reports 1843 to 1871 inclusive. 60 vols. Complete, with the exception of vol. 3, 1870.
Official Gazette, 1872, weekly to date. 2 vols. each year.
Index of Inventions. 1790 to 1873. 3 vols.
Annual Indexes. Inventors and Inventions. 1872 to date.
List of Patents and Patentees to 1830. (No title.)
Digest of Patents issued. 1790 to 1839.
Digest of Patents issued. 1839–'40–'41.
List of Patents issued. 1790–1847.
Classified Index of Subjects of Inventions. Edition of 1872. 1 vol., bound.
Same. Edition of 1880. Pamphlet.
Same. Edition of 1881. Pamphlet.

Commissioner's Decisions:
For 1869–'70–'71, bound in 1 vol.
For 1872–'73–'74, bound in 1 vol.
For 1875–'76, in 1 volume, with Decisions of United States Courts in Patent Cases.
For 1877–'78–'79, 1 vol. each year, with Decisions of United States Courts.
Patent Laws. Various editions. Pamphlet.
Laws of the United States relating to Patents, with Decisions of the Courts, and Opinions of Hon. W. Cranch upon Appeals. 1848.
Rules of Practice: Patents. Various editions. Pamphlets.
Rules of Practice: Trade Marks. Various editions. Pamphlets.
(Patents printed in 1861. 14 vols. Specifications, 1 Reissues, 1 Designs.)
Copies of Patents. June 1, 1865, to date.
Copies of Trade-Marks. July, 1870, to date.
Monthly vols. Specifications and Drawings. From May 31, 1871, to date. (Under sections 490 and 491.) 1 vol. each month.
Copies of Patents. Special classes as follows: Classes of Fishing and Trapping and Electricity, and the subclasses of Cartridges, Hand-Binders, Magazine-Guns, Self-Binders, and Time-Locks.
Patents on Electricity. 16 vols., bound. Edition of 1881.
Patents on Fishing and Trapping. 1 vol., bound. Edition of 1880.
Catalogue of Patent Office Library. 1847.
Catalogue of Patent Office Library. 1878.
Meteorological Observations, made under the direction of the United States Patent Office and the Smithsonian Institution. 1854–'59. 2 vols.
(Report of Commissioner of Patents, "Confederate States." 1864.)

GENERAL LAND OFFICE.

October 5, 1796.—Instructions in relation to forms to be used by the receiver of public moneys and method of conducting the sales of certain lands surveyed in pursuance of an ordinance of Congress passed on the 20th of May, 1785.
March 11, 1799.—Public notice issued under acts of Congress approved June 1, 1796, and March 2, 1799, in relation to grants of land appropriated for military service and for the society of United Brethren for propagating the gospel among the heathen.
September 26, 1800.—Circular to receiver of public moneys relating to forms to be used in, and method of accounts to be rendered for, the sales of public lands.
June 9, 1801.—Circular in relation to issuing final certificates.
June 19, 1801.—Method of keeping books and rendering accounts of sales of public lands.
June 27, 1801.—In the matter of forms of certificates and payments on lands.
April 5, 1802.—Regulation to prevent the reversion to the United States of certain lands under the seventh section of act of May 10, 1800.
August 9, 1803.—Rules governing the disposal of fractional sections of land.
March 30, 1804.—Circular relating to interest on installments, salary of register, and fees.
April 10, 1804.—Instructions for the disposal of lands in the Indian Territory.

April 27, 1804.—Relative to the division of lands north of the Ohio, and above the mouth of the Kentucky River, into surveying districts.
May 26, 1804.—Construction of the eighth section of act of March 26, 1804, in regard to payments on lands.
July 10, 1804.—How to estimate contents of a tract of land purchased subsequent to act of March 26, 1804.
August 7, 1804.—Explanatory of section 11 act of 26th of March, 1804, in regard to interest on installments made in payment for lands.
October 16, 1804.—Circular in regard to certain forms to be observed in sales of public lands.
March 13, 1875.—How certain lands shall be offered for sale, and construction of act concerning mode of surveying the public lands of the United States and act supplementary.
March 15, 1805.—Additional to circular of March 13, 1805, preceding.
May 9, 1805.—Rules prescribed and to be observed in the sales of public lands sold by reason of failure in completing the payments within five years after date of purchase.
July 5, 1805.—Prescribing uniform practice in granting final certificates in favor of assignees of purchasers of public lands.
July 8, 1805.—Circular relating to partial payments and rules applicable to same.
July 11, 1805.—Circular relating to reservations of certain lands for school purposes.
April 22, 1806.—Relating to payments on lands.
March 28, 1807.—Instructions under the act to prevent settlements being made on lands ceded to the United States until authorized by law.
January 13, 1808.—Rules to be observed to prevent frauds at public sales of the lands of the United States.
April 30, 1808.—Instructions to all officers of land districts to discountenance associations formed for the purpose of monopolizing purchases and preventing the highest price being obtained at public sales.
March 20, 1809.—Circular prescribing rules and regulations under the act extending the time for making payments on sales of public lands.
April 25, 1812.—Notice of establishment of land district west of Pearl River with office at Jackson Court-House, Mississippi.
September 12, 1812.—Circular prescribing rules and regulations in regard to sales of public lands and methods of payments on the same.
September 26, 1814.—Circular instructions to register at Kaskaskia, Ill., in regard to issue of certificates of confirmation to certain claimants.
December 12, 1815.—Proclamation issued by authority of the President of the United States relative to intruders upon the public lands under act of 1807.
April 25, 1816.—Notice of removal of the land office at Canton, Ohio, to Wooster in said State.
April 30, 1816.—Circular instructions under the act relating to settlers on lands of the United States with forms to be used by applicants.
July 3, 1816.—Circular instructions relative to obtaining information in regard to the lead mines and salines belonging to the United States.
November 21, 1817.—Circular relating to purchasers of public lands on the credit system—method of debiting purchasers with the lands bought and with the moneys paid.
February 23, 1820.—Circular instructions in regard to Canadian land warrant No. 206.

May 29, 1820.—Circular instructions to registers and receivers relating to the accounts of sales of public lands which, after the 30th of June next, are to be kept separate and distinct from sales made prior to that date.

June 20, 1820.—Circular instructions in relation to the disposition of fractional sections.

June 23, 1820.—Notice creating the White River land district in Arkansas.

June 23, 1820.—Notice creating the Red River land district in Arkansas.

November 20, 1820.—Surveyors-general instructed in regard to marking lines and chain to be used, &c.

January 9, 1821.—Circular relating to manner of regulating surveys of public land so as to facilitate sales at public auction.

January 30, 1821.—Relative to noticing and recording the magnetic variation.

May 1, 1821.—Circular relating to assignments and acknowledgments under new system of cash sales.

May 3, 1821.—Explanatory of certain forms.

May 5, 1821.—Instructions in regard to assignments of certificates under the new system of cash sales.

June 1, 1821.—Circular prescribing the various modes of relief for the purchasers of lands prior to July 1, 1820, and designating the persons entitled to such relief.

June 7 and 15, 1821.—Circular explanatory of the forms prescribed by the Treasury Department by which registers are to be governed in their proceedings under the act extending relief to certain purchasers referred to in circular of June 1, 1821, above.

June 15, 1821.—Notice to debtors to the United States, &c.

June 20, 1821.—Explanatory of forms referred to in circulars of June 1, 7, and 15, 1821 above.

July 3, 1821.—Further explanatory of preceding.

July 10, 1821.—Registers and receivers ordered to report tracts of land which had reverted to the United States prior to July 1, 1820.

July 13, 1821.—Relating to waste committed on the public lands and notice to intruding settlers and others who commit such waste.

July 15, 1821.—Notice to debtors to the United States for public lands.

July 21, 1821.—Notice to debtors to the United States for public lands, of the relief authorized, &c.

August 17, 1821.—Circular to registers and receivers for those districts wherein the act of 2d of March, 1821, for the relief of purchasers of public lands takes effect.

September 5, 1821.—Registers and receivers directed to inform certain parties interested the reasons why their patents have not been issued, &c.

October 29, 1821.—Registers and receivers instructed that any declaartions and relinquishments received prior to receipt of official forms will be regarded as valid.

November 9, 1821.—Circular relating to sales of fractional sections and divisions thereof.

November 30, 1821.—Circular relating to monthly returns of moneys paid by individuals on account of lands further credited under relief law.

January 1, 1822.—Circular respecting correction of errors in entries made under act of March 3, 1819.

April 22, 1822.—Report of the Commissioner of the General Land Office to the Secretary of the Treasury under House resolution of January 29, 1822, in relation to the claim of Jonathan Carver to certain lots near the Falls of Saint Anthony.

May 6, 1822.—Notice of removal of land office from Arkansas to Little Rock in Arkansas.

May 6, 1822.—Notice of removal of land office from Dardanelles to Batesville in Arkansas.

May 7, 1822.—Circular extending further relief to purchasers or legal holders of certificates of purchase of public lands who have not availed themselves of benefits of act of March 2, 1821, and whose lands were not forfeited to the United States.

May 24, 1822.—Extending further relief under certain conditions to persons named in circular of May 7, 1822.

July 3, 1822.—Construction of supplementary act for the relief of purchasers of public lands.

January 2, 1823.—Directing sales of fractional sections with certain exceptions.

March 14, 1823.—Instructions under an act extending further relief to purchasers of public lands prior to 1st of July, 1820.

June 13, 1823.—Proclamation ordering sales of public lands to be held at Edwardsville, Ill.; Fort Wayne, Ind.; Saint Louis, Jackson, and Franklin, Mo.; Independence and Little Rock, Ark.; Jackson, Miss.; and Saint Stephens and Sparta, Ala.

June 18, 1823.—Additional to circular of January 2, 1823, above.

July 10, 1823.—Circular under the old system of sales.

August 4, 1823.—Circular relating to auditing and settling accounts of surveyors of public lands in Illinois, Missouri, and Arkansas, for extra clerk hire.

October 28, 1823, and November 3, 1823.—Circulars to registers and receivers of land offices in operation prior to July 1, 1820, relating to disposition of fractional sections and parts thereof relinquished to the United States.

January 6, 1824.—Relating to disposal of relinquished and forfeited lands.

January 6, 1824.—Proclamation ordering sales of lands at public auction at Cahaba and Saint Stephens, Ala., and Washington, Miss.

February 2, 1824.—Proclamation ordering sales at Detroit, Mich.

February 22, 1824, March 6, 1824, and May 25, 1824.—Instructions to registers under the old credit system to reserve certain lands from sale on account of balances due, &c., right of parties to relinquish, and for other reasons.

April 22, 1824.—Proclamation ordering sales of Cahaba, Ala.

April 22, 1824.—Proclamation ordering sales at Vincennes and Jeffersonville, Ind., and Kaskaskia, Edwardsville, and Shawneetown, Ill.

May 25, 1824.—Circular relating to extinguishment of debt to United States by purchasers of public lands.

June 2, 1824.—Instructions under the act providing for the correction of errors in making entries of land.

June 7, 1824.—Circular relating to how a constituted authority of a State or particular county or parish, under act of 26th of May, 1824, may enter one quarter section of land for the seat of justice of said county or parish.

June 15, 1824.—Proclamation issued under authority of the President of the United States, ordering sales of lands at public auction at Terre

Haute, Ind.; Palestine and Springfield, Ill.; Franklin, Lexington, and Saint Louis, Mo., and Batesville and Little Rock, Ark.
June 25, 1824.—Proclamation ordering sales, &c., at Batesville, Ark.
July 14, 1824.—Proclamation ordering sales, &c., at Tuscaloosa and Huntsville, Ala.
July 15, 1824.—Proclamation ordering sales, &c., at Jackson, Miss.; lands ceded by the Choctaws.
July 22, 1824.—Proclamation, &c., at Monroe, Mich.
September 20, 1824.—Proclamation, &c., at Washington, Miss.
November 14, 1824.—Proclamation, &c., Huntsville, Ala.
December 20, 1824.—Proclamation suspending sales in Alabama, until further notice.
December 29, 1824.—Notice of postponement of sales in Alabama; ordered July 14, 1824.
January 26, 1825.—Proclamation, &c., at Saint Louis, Mo.
January 26, 1825.—Proclamation, &c., at Tallahassee, Fla.
January 26, 1825.—Proclamation, &c., Detroit and Monroe, Mich.
February 5, 1825.— Order to suspend from sale certain public lands.
February 7, 1825.—Proclamation, &c., at Jackson, Miss.
March 1, 1825.—Circular extending further credit to holders of certificates in the third class.
March 16, 1825.—Circular to all credit system land offices in regard to manner in which the statements relative to forfeited lands are to be rendered.
April 12, 1825.—Proclamation, &c., Steubenville, Ohio.
May 31, 1825.—Instructions as to furnishing local offices, and for preservation of, township plats.
June 13, 1825.—Circular in relation to rendering accounts for sale of public lands.
June 30, 1825.—Proclamation, &c., ordering sales, &c., at Tuscaloosa, Ala.
June 30, 1825.—Proclamation, &c., Sparta, Ala.
June 30, 1825.—Proclamation, &c., Batesville, Ark.
June 30, 1825.—Proclamation, &c., Jackson, Miss.
June 30, 1825.—Proclamation, &c., Fort Wayne, Ind.
August 20, 1825.—Instructions relating to furniture for local offices.
October 6, 1825.—Circular relative to furnishing the State authorities with list of all lands relinquished under the acts of 1821, 1822, 1823, and 1824.
December 10, 1825.—Proclamation ordering sales, &c., at Huntsville, Ala.
January 30, 1826.—Permanent instructions relating to new appointment of a receiver; sales to be suspended until official bond executed.
January 31, 1826.—Proclamation ordering sales, &c., at Jackson, Miss.; another proclamation was issued ordering sales at same place on same day.
February 22, 1826.—Circular in relation to receipts and deposits of moneys received for public lands. Issued by Secretary of the Treasury and sent to all receivers of public moneys.
May 6, 1826.—Instructions under act providing for the extinguishment of the debt due to the United States by purchasers of public lands. See circular of May 26, 1824.
May 6, 1826.—Proclamation ordering sales, &c., at Ouachita, La.
May 24, 1826.—Rules to be observed in making selections of lands appropriated for school purposes.

May 24, 1826.—Proclamation ordering sales, &c., at Springfield, Ill.
May 24, 1826.—Proclamation, &c., at Tallahassee, Fla.
May 31, 1826.—Circular relative to compensating receivers for transporting and depositing money.
June 14, 1826.—Circular relative to returns of forfeited lands which may be redeemed under act of 4th of May last.
June 24, 1826.—Forms of returns in relation thereto. Circular immediately preceding.
July 24, 1826.—Forms of relinquishment, and official certificates to be used under the relief law.
August 1, 1826.—Proclamation ordering sales, &c., at Batesville, Ark., and also Little Rock, Ark.
August 4, 1826.—Proclamation, &c., at Jackson, Miss.
August 5, 1826.—Proclamation ordering public sale of the naval arsenal with grounds and buildings and certain lots in New Orleans, La.
August 8, 1826.—Further instructions under the relief law in matter of parts of fractional sections.
January 10, 1827.—Proclamation ordering sales at Sparta, Ala.
January 10, 1827.—Proclamation ordering sales at Jackson, Miss.
January 10, 1827.—Proclamation ordering sales at Tallahassee, Fla.
February 15, 1827.—Regulation sprescribed by Treasury Department in regard to compensating receivers for transporting and depositing public moneys.
March 12; 1827.—Proclamation ordering sales at the several land offices in Ohio, Indiana, Illinois, and Missouri.
March 12, 1827.—Proclamation ordering sales, &c., at Monroe, Mich.
March 12, 1827.—Proclamation ordering sales, &c., at Detroit, Mich.
May 11, 1827.—Proclamation, &c., at Franklin and Palmyra, Mo.
May 28, 1827.—Proclamation, &c., at Tallahassee, Fla.
May 28, 1827.—Proclamation, &c., at Crawfordville, Ind.
May 28, 1827.—Proclamation, &c., at Cahaba, Ala.
May 28, 1827.—Proclamation, &c., at Springfield, Ill.
May 28, 1827.—Proclamation, &c., at Zanesville, Ohio.
June 28, 1827.—Proclamation, &c., Vandalia, Ill.
July 14, 1827.—Proclamation, &c., at Washington, Miss.
July 14, 1827.—Proclamation, &c., Palestine, Ill.
October 18, 1827.—Notice of postponement of sales in Ala. ordered May 28, 1827.
October 18, 1827.—Proclamation ordering sales, &c., at Tuscaloosa, Ala.
October 25, 1827.—Order declaring certain lands sold under the credit system forfeited to the United States.
October 25, 1827.—Circular on the same subject.
February 5, 1828.—Proclamation ordering sales at Saint Augustine, East Fla.
February 5, 1828.—Proclamation ordering sales at Mount Salus, Miss.
February 14, 1828.—Proclamation ordering sales at Ouachita, La.
February 22, 1828.—Modification of circular of February 22, 1826.
April 3, 1828.—Circular, further instructions relating to the extinguishment of the debt due the United States by purchasers of public lands. See instructions of May 25, 1824, and May 6, 1826.
May 24, 1828.—Instructions under act for the relief of purchasers of public lands which have reverted for non-payment of purchase money.
June 18, 1828.—Proclamation ordering sales at Jackson, Mo.
June 18, 1828.—Proclamation ordering sales at Monroe, Mich.
June 18, 1828.—Proclamation ordering sales at Lexington, Mo.
June 18, 1828.—Proclamation ordering sales at Cahaba, Ala.

June 18, 1828.—Proclamation ordering sales at Little Rock, Ark.
June 18, 1828.—Proclamation ordering sales at Tuscaloosa, Ala.
July 21, 1828.—Proclamation ordering sales at Batesville, Ark.
July 28, 1828.—Circular in regard to the issuing of forfeited land stock under act of May 23, 1828.
October 4, 1828.—Proclamation ordering sales of lands at Tallahassee, Fla.
October 16, 1828.—Proclamation, &c., at Augusta, Miss., and Saint Stephens, Ala.
January 8, 1829.—Reiterating instructions of June 15, 1821, issued under act of 2d of March, 1821.
January 10, 1829.—Proclamation ordering sales at Little Rock and Batesville, Ark.
February 2, 1829.—Proclamation ordering sales at Monroe, Mich.
February 14, 1829.—Proclamation, &c., at Franklin, Mo.
February 14, 1829.—Proclamation, &c., at Mount Salus, Miss.
February 24, 1829.—Proclamation, &c., at Detroit, Mich.
February 24, 1829.—Proclamation, &c., at Tallahassee, Fla.
June 4, 1829.—Circular relating to certain certificates receivable as cash in payment for lands.
June 13, 1829.—Method to be observed in rendering joint reports by local officers of monthly operations.
June 13, 1829.—Proclamation ordering sales at Saint Helena, La.
July 3, 1829.—Proclamation, &c., at Springfield, Ill.
July 3, 1829.—Proclamation, &c., at Vandalia, Ill.
July 16, 1829.—Proclamation, &c., at Mount Salus, Miss.; lands ceded by the Choctaws.
July 16, 1829.—Proclamation, &c., at Ouachita, La.
July 29, 1829.—Proclamation, &c., at Sparta, Ala.
August 18, 1829.—Proclamation, &c., at Opelousas, La.
August 19, 1829.—Proclamation, &c., at Crawfordsville, Ind.
September 13, 1829.—Proclamation, &c., at Jeffersonville and Vincennes, Ind.
September 13, 1829.—Proclamation, &c., at Steubenville, Chillicothe, Cincinnati, Wooster, Marietta, Zanesville, and Tiffin, Ohio.
October 5, 1829.—Proclamation, &c., at Huntsville, Ala.
October 5, 1829.—Proclamation, &c., at Tallahassee, Fla.
December 3, 1829.—Proclamation, &c., at Saint Stephens, Cahaba, and Huntsville, Ala.
December 4, 1829.—Proclamation, &c., at Mobile, Ala., of certain town lots.
March 3, 1830.—Proclamation, &c., at Saint Louis, Mo., of certain lead mines in said State.
April 15, 1830.—Instructions under the act of March 3, 1830, for the relief of purchasers of public lands and for the suppression of fraudulent practices at public sales.
April 16, 1830.—Additional to circular of April 15, 1830.
June 1, 1830.—Public notice to claimants of lands, under British grants, situated in the land district west of Pearl River and east of the island of New Orleans, embraced in certificates 1 to 75 inclusive, as per abstract, not recognized by any law of the United States.
June 5, 1830.—Proclamation ordering sales at Huntsville, Sparta, and Cahaba, in Alabama.
June 5, 1830.—Proclamation, &c., at Edwardsville, Ill.
June 5, 1830.—Proclamation, &c., at Mount Salus, Miss.
June 5, 1830.—Proclamation, &c., at Little Rock, Ark.

June 5, 1830.—Proclamation, &c., at Monroe and Detroit, Mich.
June 5, 1830.—Proclamation, &c., at Tallahassee, Fla.
June 5, 1830.—Proclamation, &c., at New Orleans and Saint Helena, La.
June 10, 1830.—Circular in relation to pre-emption rights under act of May 29, 1830.
June 15, 1830.—Proclamation ordering sales at Crawfordsville and Fort Wayne, Ind.
August 31, 1830.—Circular relating to correction of errors in entries of public lands.
September 14, 1830.—Additional to circular of June 10, 1830.
October 20, 1830.—Circular in relation to furnishing copies of records.
November 16, 1830.—Instructions under act of May 30, 1830, for relief of officers and soldiers of the Virginia line and Continental Army during Revolutionary war. Circular sent to land officers in Ohio, Indiana, and Illinois.
December 28, 1830.—Circular relating to lands subject to private entry subsequent to their reversion.
February 7, 1831.—Circular in relation to proof by pre-emptors under act of May 29, 1830.
March 9, 1831.—Circular under act of March 31, 1830, and relating to forms and blanks to be used applicable to provisions of the act for the relief of purchasers and suppression of fraudulent practices at public sales.
March 25, 1831.—Proclamation ordering sales at Marietta, Zanesville, Steubenville, Chillicothe, Cincinnati, Wooster, and Tiffin, Ohio.
March 25, 1831.—Proclamation ordering sales at Vandalia and Springfield, Ill.
March 25, 1831.—Proclamation ordering sales at Batesville and Little Ark.
March 25, 1831.—Proclamation ordering sales at Opelousas and Washita, La.
March 25, 1831.—Proclamation ordering sales at Mount Salus and Augusta, Miss.
March 25, 1831.—Proclamation ordering sales at Monroe, Mich.
March 25, 1831.—Proclamation ordering sales at Saint Louis, Palmyra, Franklin, Lexington, and Jackson, Mo.
March 25, 1831.—Proclamation ordering sales at Vandalia and Springfield, Ill.
March 25, 1831.—Proclamation ordering sales at Saint Stephens, Sparta, Cahaba, Tuscaloosa, and Huntsville, Ala.
March 25, 1831.—Proclamation, &c., at Saint Augustine and Tallahassee, Fla.
March 25, 1831.—Proclamation, &c., at Vincennes, Jeffersonville, Fort Wayne, and Crawfordsville, Ind.
April 6, 1831.—Circular relating to lands relinquished or which have reverted to the United States, and copies of proclamation of sales of said lands sent for distribution.
May 1, 1831.—Circular issued by Secretary of the Treasury, and transmitted to all receivers of public moneys, relating to receipts and deposits, and modifying circular of February 22, 1826, on the same subject.
May 25, 1831.—Prescribing rules and regulations for the government of registers and receivers in the discharge of their duties.
May 27, 1831.—Instructions to registers and receivers of the credit system land offices, in respect to lands not liable to sale under the President's late proclamation, and prescribing methods to hasten

payments of small balances due the United States, and the surrender of certificates for the credit.

May 28, 1831.—Circular in relation to inadequacy of allowance for transporting public moneys.

September 29, 1831.—Circular relating to monthly abstracts.

January 24, 1832.—Registers and receivers required to live at the place where local land office is located.

March 10, 1832.—Registers and receivers ordered to furnish statement of lands offered and which remained unsold and subject to entry on December 31, 1831.

May 8, 1832.—Circular to surveyors-general under act of April 5, 1832, relating to subdivision of sections and survey of fractional sections, issued by Secretary of the Treasury.

May 8, 1832.—Circular relating to pre-emption privileges to all actual settlers being housekeepers upon the public lands.

July 2, 1832.—Proclamation ordering sales at public auction to be held at White Pigeon Prairie and Detroit, Mich.

July 19, 1832.—Proclamation, &c., at Fort Wayne and Crawfordsville, Ind.

July 19, 1832.—Proclamation, &c., at Jackson and Lexington, Mo.

July 21, 1832.—Proclamation, &c., at Danville, Ill.

July 21, 1832.—Proclamation, &c., at Cahaba, Ala., for sale of town lots in Wetumpka, Ala.

July 28, 1832.—Circular in relation to pre-emption rights under act of May 29, 1830.

August 30, 1832.—Circular relating to selections of school lands under act of May 20, 1826.

October 24, 1832.—Circular to registers and receivers of credit system land offices, in reference to the construction of the general provisions of act of May 23, 1828, for the relief of purchasers of lands which have reverted for non-payment, and instructions thereunder.

November 7, 1832.—Instructions to the commissioners charged with the examination of all the unconfirmed claims to lands in Missouri founded on foreign titles.

November 13, 1832.—Proclamation ordering sales of public lands to be held at Piqua and Bucyrus, Ohio.

December 3, 1832.—Report, annual, of the Commissioner of the General Land Office for the fiscal year ending June 30, 1832.

December 16, 1832.—Additional to instructions in regard to selections of school lands.

May 17, 1833.—Circular relative to right of pre-emption of two quarter quarters to persons entitled to benefits under act of April 5, 1832.

June 6, 1833.—Notice of opening land office at Columbus, Miss.

August 1, 1833.—Circular in relation to entries under acts of April 5, 1832, and March 2, 1833.

August 12, 1833.—Proclamation ordering sales to be held at Chocchuma, Columbus, Augusta, and Mount Salus, in Mississippi.

September 3, 1833.—Proclamation, &c., at Bucyrus and Wapakoneta, Ohio.

September 3, 1833.—Proclamation, &c., at Batesville, Little Rock, and Washington, Ark.

September 3, 1833.—Proclamation, &c., at White Pigeon Prairie Mich.

October 2, 1833.—Circular in relation to grant of additional land for the location of Revolutionary bounty land warrants under act of March 2, 1833.

November 30, 1833.—Annual report of the Commissioner of the General Land Office.
December 17, 1833.—Proclamation ordering sales to be held at Montevallo, Coosa district, and Montgomery, in the Tallapoosa district, in Alabama.
December 20, 1833.—Notice of removal of land office at Montevallo to Mardisville, in Alabama.
December 30, 1833.—Notice of removal of land office from Montevallo to Mardisville, in Alabama.
December 31, 1833.—Circular relating to act of 5th April, 1832, granting privilege of entering two adjacent quarter quarters of a section, &c.
January 15, 1834.—Referring to circular of May 1, 1831, relating to the indorsements required to be made on receipts given in payment for public lands.
March 1, 1834.—Circular in relation to pre-emption rights under act of July 14, 1832, and construction of said act.
July 7, 1834.—Proclamation ordering sales of land to be held at Mineral Point, Wis.
July 7, 1834.—Proclamation, &c., Crawfordsville, Ind., and Palestine, Ill.
July 7, 1834.—Proclamation, &c., Mardisville, Montgomery, Saint Stephens, Demopolis, Tuscaloosa, Huntsville, and Cahaba, Ala.
July 7, 1834.—Proclamation, &c., Chocchuma, Columbus, Augusta, and Mount Salus, Miss.
July 7, 1834.—Proclamation, &c., Jackson, Saint Louis, and Fayette, Mo.
July 7, 1834.—Proclamation, &c., Detroit and Bronson, Mich.
July 7, 1834.—Proclamation, &c., Tallahassee and Saint Augustine, Fla.
July 7, 1834.—Proclamation, &c., Washington, Fayetteville, and Little Rock, Ark.
July 22, 1834.—Circular in relation to act of 19th of June, 1834, granting pre-emption rights to settlers on the public lands—rules and regulations prescribed for the government of officers, forms, &c.
July 22, 1834.—Circular relating to certain lands granted to exiles from Poland.
August 20, 1834.—Circular (issued by Comptroller of the Treasury and sent to all local officers) relating to criers and clerks at sales of public lands and adjustment of accounts of receivers.
August 28, 1834.—Circular in relation to books to be hereafter used in local land offices and rendering of quarterly accounts and regulations as to preservation of plats, &c.
September 24, 1834.—Circular relating to the floating rights of entry granted by the treaty of Dancing Rabbit Creek.
October 21, 1834.—Supplemental instructions under pre-emption act of June 19, 1834, issued by order of the Secretary of the Treasury.
October 23, 1834.—Instructions under act of June 19, 1834, supplemental.
November 15, 1834.—Circular relating to suspending certain lands from public sale proposed to be selected by Indian chiefs under treaty stipulations.
November 21, 1834.—Proclamation ordering sales of lots in town of Saint Marks, at Tallahassee, Fla.
November 29, 1834.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury, showing operations under the land laws during the fiscal year.

January 28, 1835.—Circular in relation to form of reports and statements to be furnished the General Land Office by local officers.
February 12, 1835.—Proclamation ordering sales at Quincy, Ill.
February 12, 1835.—Proclamation ordering sales at Chicago, Ill.
March 2, 1835.—Proclamation, &c., at Jackson, Fayette, Lexington, and Springfield, Mo.
March 6, 1835.—Proclamation, &c., at Laporte and Fort Wayne, Ind. Attached to this proclamation is a notice to pre-emption claimants to any of the lands described in proclamation requiring them to prove up prior to day of public sale.
March 6, 1835.—Proclamation, &c., Mineral Point, Wis.
March 6, 1835.—Proclamation, &c., Detroit, Mich.
March 6, 1835.—Proclamation, &c., Danville, Ill.
March 6, 1835.—Proclamation, &c., Green Bay, Mich., and notice to pre-emption claimants attached to each as above.
March 9, 1835.—Circular in relation to assignments of pre-emption rights. See eleventh section, circular July 22, 1834.
March 13, 1835.—Circular in relation to levees on the Mississippi and other rivers.
June 24, 1835.—Proclamation ordering sales at Pontotoc, Miss.
August 15, 1835.—Proclamation, &c., Green Bay, Mich.
August 15, 1835.—Proclamation, &c., Columbus, Chocchuma, and Mount Salus, Miss.
October 13, 1835.—Proclamation, &c., Saint Augustine, Fla., and notice.
December 3, 1835.—Annual report of Commissioner of the General Land Office to the Secretary of the Treasury.
December 22, 1835.—Proclamation ordering sales to be held on a certain day at Bucyrus, Chillicothe, and Marietta, Ohio.
December 31, 1835.—Proclamation, &c., at Fayetteville, Little Rock, and Helena, Ark.
January 1, 1836.—Circular relating to lands improperly withheld from entry and oath prescribed by circular of 2d October, 1833, to be hereafter dispensed with.
February 20, 1836.—Proclamation ordering sales at Chocchuma, Miss., and notice to claimants February 20, 1836, proclamation, &c., Jackson Mo., and notice to claimants.
April 1, 1836.—Notice of removal of land office from Bronsen to Kalamazoo, Mich.
April 14, 1836.—Report of Commissioner in relation to surveys made in Illinois and Missouri made to Secretary of the Treasury.
April 23, 1836.—Notice of land office at Marion, Ohio, created by treaty with Wyandots.
May 7, 1836.—Circular in relation to pre-emption and floating rights, &c., when surveys are completed or may be completed before 19th of June, 1834.
May 25, 1836.—Circular relating to receivers' bonds.
July 11, 1836.—Circular relating to kind of money to be received in payment of public lands.
September 12, 1836.—Circular relating to preventing impositions and mistakes for money paid on account of lands sold at private entry.
October 12, 1836.—Receipts of the Treasurer to be regarded as cash in payments of lands, and to be treated in same manner as military land scrip and forfeited land stock; regulations relating to monthly abstracts and settlements with United States Treasury.
November 30, 1836.—Circular relating to forms in cases of forfeited land stock.

December 1, 1836.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury.
December 12, 1836.—Proclamation ordering sales at Marion, Ohio, and notice to claimants.
February 21, 1837.—Proclamation, &c., at Pontotoc, Miss., under provision of treaty between the United States and Chickasaw Indians.
February 25, 1837.—Report of Commissioner of the General Land Office to the Secretary of the Treasury relative to surveys in Illinois and Missouri.
May 17, 1837.—Circular of Treasury Department to receivers relative to drafts to be hereafter issued.
May 28, 1837.—Circular relating to surveyor-generals' annual estimates, &c.
June 8, 1837.—Circular relative to general reports on the condition of each surveying district.
June 9, 1837.—Circular relating to deposits in cases where banks heretofore depositories have suspended specie payment.
June 9, 1837.—Treasury circular sent to each receiver in regard to disposition of public lands.
June 9, 1837.—Construction of act of June 19, 1834, and instructions thereunder relating to pre-emption rights.
June 13, 1837.—Circular to surveyors-general instructing them to furnish registers and receivers plats of townships not heretofore furnished.
June 20, 1837.—Circular relative to course to be pursued by disbursing officers in consequence of suspension of specie payments by banks where they made deposits.
September 26, 1837.—Circular relating to disbursement of appropriations.
September 30, 1837.—Circular to registers, instructing them to examine the public moneys in hands of receivers.
October 1, 1837.—Supplemental to instructions of 9th of June, 1837, preceding.
October 25, 1837.—Circular relating to Treasury notes to be received in payment for sales of public lands.
November 3, 1837.—Circular relating to Treasury notes issued to receivers for disbursements.
November 29, 1837.—Proclamation ordering sales at Chocchuma and Columbus, Miss.
November 29, 1837.—Proclamation, &c., at Mardisville, Montgomery, Sparta, Saint Stephens, Cahaba, Tuscaloosa, and Huntsville, Ala.
November 29, 1837.—Proclamation, &c., at Helena and Batesville, Ark.
December 12, 1837.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury.
January 5, 1838.—Proclamation ordering sales at Green Bay, Wis.
January 12, 1838, and February 19, 1838.—Letters of Comptroller of the Treasury printed and sent to receivers relating to changes in mode of settling their accounts.
February 13, 1838.—Public notice that sales of lands advertised to take place in Alabama and Wisconsin, are postponed until further notice.
February 14, 1838.—Notice of postponement of public sales in Arkansas.
March 1, 1838.—Circular relating to Treasury notes.
March 5, 1838.—Letter of Secretary of Treasury requesting settlement

of receivers' accounts according to instructions of December 27, 1837, printed and sent to receivers.

March 29, 1838.—Proclamation ordering sales at Laporte, Ind.

April 6, 1838.—Proclamation, &c., at Danville, Vandalia, Springfield, Shawneetown, and Quincy, Ill.

April 17, 1838.—Proclamation, &c., at Ouachita, Opelousas, and New Orleans, La.

April 19, 1838.—Proclamation, &c., at Marion, Ohio.

April 28, 1838.—Proclamation, &c., at Helena, Batesville, Fayetteville, and Little Rock, Ark.

May 7, 1838.—Proclamation, &c., at Mardisville, Montgomery, Tuscaloosa, Huntsville, and Demopolis, Ala.

May 14, 1838.—Proclamation, &c., at Chocchuma, Columbus, and Augusta, Miss.

June 1, 1838.—Circular (Treasury Department) to receivers of public moneys under resolution of 31st of May, 1838.

July 3, 1838.—Circular relative to qualifications required under act of June 22, 1838, granting pre-emption rights to settlers on the public lands, and describing lands exempted from operation of act; assignments; forms of receipts, and final certificates, &c.

July 6, 1838.—Proclamation ordering sales at Bucyrus, Ohio, and notice to claimants.

July 6, 1838.—Proclamation, &c., Green Bay, Milwaukee, and Mineral Point, Wis.

July 6, 1838.—Proclamation, &c., Little Rock and Fayetteville, Ark., and notice to claimants.

July 6, 1838.—Proclamation, &c., Burlington, Dubuque, Iowa, and notice to claimants.

July 6, 1838.—Proclamation, &c., Montgomery, Ala., and notice to claimants.

July 6, 1838.—Proclamation, &c., Laporte, Crawfordsville, and Vincennes, Ind., and notice to claimants.

July 7, 1838.—Proclamation, &c., Danville, Chicago, Galena, and Quincy, Ill., and notice to claimants.

July 7, 1838.—Proclamation, &c., Saint Louis, Jackson, Lexington, Fayette, and Springfield, Mo., and notice to claimants.

July 7, 1838.—Proclamation, &c., Detroit, Genessee, Ionia, and Kalamazoo, Mich., and notice to claimants.

July 13, 1838.—Proclamation, &c., New Orleans, Opelousas, La., and notice to claimants.

July 14, 1838.—Proclamation &c., Saint Augustine, Fla., and notice to claimants.

July 17, 1838.—Supplemental to circular of July 3, 1838.

July 23, 1838.—Notice of postponement of public sales and private entries of lands within the limits of country ceded by the Choctaw Indians, by treaty of September, 1830, and sales ordered to be held in Mississippi on May 14, 1838, indefinitely postponed.

July 31, 1838.—Proclamation ordering sales at Natchitoches, La., and notice to claimants to prove up, &c.,

August 4, 1838.—Circular relating to lands in Mississippi and Alabama, embracing country ceded by the Choctaws under the treaty of Dancing Rabbit Creek.

August 31, 1838.—Proclamation ordering sales of lands at Springfield, Mo., and notice to claimants to prove up, &c.

September 12, 1838.—Proclamation postponing sales in Louisiana; advertised for October 8, 1838.

October 11, 1838.—Postponing sales in East Florida for four weeks.
October 11, 1838.—Notice of removal of land office at Laporte to Winamac, Ind., rescinded and Laporte continued.
October 24, 1838.—Order to registers and receivers to report, if any, undue attempts or practices since May 30, 1830, to keep down the price of public lands or to prevent purchases or entries at public or private sale by force, threats, or fraud, &c., under House resolution of 7th of July, 1838.
October 29, 1838.—Notice of postponement of public sales in Wisconsin.
November 30, 1838.—Proclamation ordering sales at Danville, Ill.; and notice to pre-emption and other claimants to prove up, &c.
December 6, 1838.—Letter of Comptroller of the Treasury relating to defaults by receivers; sent to each receiver.
December 17, 1838.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury.
January 1, 1839.—Circular, issued by Secretary of the Treasury, sent to receivers, relating to the kind of bank notes to be received by them in payment for public lands.
January 16, 1839.—Supplemental to annual report of Commissioner dated December 17, 1838, above.
January 18, 1839.—Proclamation ordering sales at Fayetteville, Ark., with notice to claimants to prove up, &c.
March 18, 1839.—Proclamation, &c., Fayetteville, Ark., with notice to claimants to prove up, &c.
April 16, 1839.—Circular relating to duties of registers to examine the public moneys in possession of receivers.
May 16, 1839.—Proclamation, ordering sales at Washington, Johnson Court-House, and Fayetteville, Ark., with notice to claimant to prove up, &c.
May 20, 1839.—Proclamation ordering sales at Chicago, Ill., with notice to claimant to prove up, &c.
June 4, 1839.—Proclamation, &c., at Danville, Chicago, and Galena, Ill., with notice to claimant to prove up, &c.
June 21, 1839.—Circular relating to transmission of monthly returns by local land officers.
June 22, 1839.—Proclamation ordering sales to be held at Milwaukee, Wis.
July 20, 1839.—Proclamation, &c., at Galena and Chicago, with notice to claimants to prove up, &c.
August 1, 1839.—Instructions relating to lands in the District of Columbia; laws of Maryland apply thereto, &c.
September 2, 1839.—Circular as to how receivers should keep their accounts with the United States.
September 20, 1839.—Proclamation ordering sales at Chicago, Ill., with notice to claimants to prove up, &c.
September 30, 1839.—Circular relating to allowances to receivers for making deposits.
November 11, 1839.—Notice of deferred land sales at Chicago, Ill.
November 13, 1839.—Proclamation ordering sales at Danville, Ill., with notice to claimants to prove up, &c.
November 16, 1839.—Proclamation, &c., Batesville, Fayetteville, Johnson Court-House, Washington, Little Rock, and Helena, Ark., with notice to settlers &c., to prove up, &c.
December 7, 1839.—Proclamation, &c., Milwaukee, Wis.

December 7, 1839.—Proclamation, &c., Green Bay, Wis., with notice to settlers and others to prove up, &c.
December 27, 1839.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury.
December 30, 1839.—Notice, sales in Illinois deferred.
January 12, 1840.—Proclamation ordering sales at Chicago and Danville and Galena, Ill., with notice to claimants to prove up, &c.
February 1, 1840.—Notice that pre-emption laws of June 22, 1838, will expire June 21, 1840.
March 23, 1840.—Proclamation ordering sales at Washington, Little Rock, Johnson Court-House, and Fayetteville, in Arkansas, with notice to pre emption claimants, &c.
April 3, 1840.—Notice of partial postponement of sales in Iowa, Illinois, and Michigan, with notice to claimants and others to prove up prior to public sales.
May 4, 1840.—Proclamation, &c., at Batesville, Fayetteville, Little Rock, Johnson Court-House, and Washington, Ark., with notice to claimants, &c.
June 8, 1840.—Proclamation, &c., at Danville, Chicago, and Quincy, Ill., with notice to claimants, &c.
June 20, 1840.—Proclamation, &c., at Batesville, Johnson Court-House, Fayetteville, in Arkansas, with notice to claimants, &c.
June 20, 1840.—Proclamation, &c., at Mineral Point, in Wisconsin, with notice to claimants, &c.
June 30, 1839.—Circular relating to pre-emption rights under act of June 22, 1840.
June 9, 1840.—Circular under act of July 4, 1840, relative to the collecting and safe keeping of the public funds.
July 17, 1840.—Circular relating to the transmission of bonds under act of July 4, 1840.
July 23, 1840.—Proclamation, &c., at Chicago and Palestine, Ill., with usual notice, &c.
July 28, 1840.—Notice of discontinuance of the land offices at Marietta, Steubenville, Zanesville, Cincinnati, and Wooster, Ohio.
July 31, 1840.—Circular relating to manner of making reports under Senate resolution of 20th instant.
August 7, 1840.—Proclamation, &c., at Johnson Court-House, Washington, Little Rock, Helena, and Fayetteville, Ark., with usual notice, &c.
September 6, 1840.—Notice postponing sales in Illinois.
October 20, 1840.—Notice postponing sales in Arkansas.
November 4, 1840.—Proclamation, &c., at Helena, Little Rock, Batesville, Johnson Court-House, Fayetteville, and Washington, Ark., with usual notice, &c.
December 30, 1840.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury.
February 8, 1841.—Proclamation, &c., at Chicago, Dixon, and Quincy, Ill., with notice to claimants to prove up, &c.
February 20, 1841.—Proclamation, &c., at Mineral Point, Wis., with notice to claimants, &c.
February 26, 1841.—Removal of land office from Mineral Point to Muskoday, Wis.
March 3, 1841.—Circular in relation to disbursements.
April 30, 1841.—Proclamation, &c., at Danville, Ill., with notice to claimants, &c.
April 30, 1841.—Proclamation, &c., at Batesville, Ark., with notice to claimants, &c.

June 9, 1841.—Indefinite postponement of sales in Illinois.
September 15, 1841.—Circular relating to pre-emption rights under act of September 4, 1841.
October 12, 1841.—Proclamation, &c., with notice, &c., same as proclamation issued November 4, 1840, ordering sales in Arkansas.
November 11, 1841.—Circular relating to monthly returns by registers.
November 25, 1841.—Modification of circular of September 15, 1841, relating to pre-emption rights under act of September 4, 1841.
December 24, 1841.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury.
January 29, 1842.—Proclamation ordering sales at Dixon, Chicago, and Kaskaskia, Ill., with notice to claimants, &c.
March 28, 1842.—Circular in relation to curtailment of expenses of General Land Office.
May 2, 1842.—Circular relating to selections by States for internal improvement under act of September 4, 1841.
May 4, 1842.—Circular relating to acts of July 14, 1832, and June 22, 1838, also June 1, 1840.
May 4, 1842.—Circular under act of July 27, 1842, for satisfying claims for bounty land, for military service in war with Great Britain; rules &c., for locating, and in regard to assignments on back of warrants.
September 27, 1842.—Proclamation ordering sales at Dixon and Chicago, in Illinois, with notice to claimants, &c.
September 27, 1842.—Proclamation, &c., at Green Bay, Wis., with notice to claimants, &c.
September 28, 1842.—Circular relating to entries under act of September 4, 1841.
September 28, 1842.—In relation to act of August 26, 1842, confirming sales of public lands in certain cases.
December 1, 1842.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury.
March 14, 1843.—Circular relating to duplicates of subdivisional plats of fractional sections.
March 16, 1843.—Circular relating to official communications, &c.
March 20, 1843.—General circular issued by Treasury Department, relating to Treasury notes and to the closing up of accounts under former bonds, &c., sent to receivers of public moneys.
April 1, 1843.—Circular issued by Treasury Department, in relation to act of March 3, 1797, for settlement of accounts between the United States and receivers.
April 11, 1843.—Notice of removal of land office from Muskoday to Mineral Point, Wis.
April 14, 1843.—Circular in relation to Treasury notes received in payment of public dues.
May 8, 1843.—Circular relating to investigation of alleged frauds under the pre-emption laws.
June 8, 1843.—Proclamation ordering sales at Dixon, Chicago, Danville, Edwardsville, and Quincy, Ill., with notice to claimants, &c.
June 8, 1843.—Proclamation, &c., same as proclamation of November 4, 1840.
June 8, 1843.—Proclamation, &c., at Green Bay, Mineral Point, and Milwaukee, Wis., with notice to claimants, &c.
June 28, 1843.—Treasury Department circular in relation to redemption of Treasury notes.
September 15, 1843.—Circular in relation to claims for repayment of money where a sale of public land has been erroneously made.

October 18, 1843.—Circular instructing registers and receivers not to collect any fees other than those prescribed by law.
November 1, 1843.—Circular relating to adjudications upon pre-emption claims under acts of 1838, 1840, and 1841.
December 26, 1843.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury.
January 27, 1844.—Circular relating to printed forms for quarterly accounts current.
March 15, 1844.—Circular relating to compensation to receivers for transporting moneys by water, &c., modifying circular of May 1, 1831.
March 30, 1844.—Instructions to disbursing agents.
May 2, 1844.—Proclamation ordering sales at Dixon, Chicago, Quincy, and Danville, in Illinois, with notice to claimants, &c.,
May 17, 1844.—Circular in relation to conflicts between the sixteenth section granted for school purposes, and private, confirmed, claims or donations.
June 19, 1844.—Circular relating to Treasury receipts and charges for transporting specie and necessary vouchers.
June 24, 1844.—Proclamation ordering sales at Quincy, Ill., with notice to claimants, &c.
June 24, 1844.—Proclamation, &c., at Mineral Point, Wis., with notice, &c.
June 24, 1844.—Proclamation, &c., same as proclamation of November 4, 1840, ordering sales in Arkansas.
June 25, 1844.—Circular relating to lands to be selected in lieu of section 16, when it conflicts with valid private claims.
July 22, 1844.—Circular in relation to sales of lands at public auction.
July 22, 1844.—Circular relating to receivers' bonds.
September 2, 1844.—Proclamation ordering sales to be held at Upper Sandusky and Chillicothe, in Ohio, and at Quincy and Dixon, in Illinois, with notice to claimants to prove up, &c.
October 8, 1844.—Proclamation, &c., at Little Rock and Helena, Ark., with notice to claimants, &c.
May 9, 1845.—Proclamation, &c., at Quincy, Dixon, and Chicago, Ill.
May 9, 1845.—Proclamation, &c., at Green Bay and Mineral Point, Wis.
May 9, 1845.—Proclamation, &c., at Champagnole, Ark., same as proclamation of November 4, 1840, except as to Helena, all with notices to claimants, &c., attached.
May 17, 1845.—Circular in relation to charges for mileage and risks in making deposits.
June 16, 1845.—Proclamation ordering sales at Milwaukee, Wis.
Jnne 28, 1845.—Circular in relation to supplying land offices with blank forms, &c.
September 1, 1845.—Circular in relation to the cancellation and transmission of Treasury notes of the new issue pursuant to Treasury circular of October 18, 1843.
October 13, 1845.—Circular in relation to postage and indorsements on public letters and documents.
November 29, 1845.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury.
February 21, 1846.—Circular in relation to simplifying the mode of making State selections under the eighth section of the act of September 4, 1841.
May 14, 1846.—Circular relating to certain affidavits required under act of April 5, 1832, to be dispensed with by act of May 8, 1846.

August 1, 1846.—Circular of Treasury Department calling the attention of receivers and disbursing officers to the sixth, ninth, fifteenth, and sixteenth sections of act of August 6, 1846, in regard to public moneys collected by them, &c.

August 12, 1846.—Proclamation ordering sales at Champagnole Ark., and as proclamation of November 4, 1840, with notice to claimants, &c.

August 17, 1846.—Proclamation, &c., at Mineral Point and Green Bay, Wis., with notice to claimants, &c.

August 25, 1846.—Circular in relation to Treasury notes received in payment for public lands.

August 25, 1846.—Circular to collectors and receivers in relation to Treasury note, received in payment for public lands.

August 25, 1846.—Instructions under the act of August 6, 1846, in relation to Treasury drafts and circulation of gold and silver, &c.

September 8, 1846.—Proclamation ordering sales at Batesville and Fayetteville, Ark., with note to claimants, &c.

September 8, 1846.—Proclamation, &c., at Dixon and Shawneetown, in Illinois, with usual notice to settlers, &c.

September 15, 1846, September 15, 1846, September 15, 1846.—Circulars relating to moneys on hand at the end of each month and regarding quarterly accounts.

October 3, 1846.—Rules and regulations relating to suspended pre-emption claims.

November 20, 1846.—Proclamation ordering sales at Mineral Point, in Wisconsin.

November 24, 1846.—Order requiring registers to transmit lists of patents remaining on hand for delivery and suspended certificates, in their respective offices.

November 30, 1846.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury.

February 2, 1847.—Circular relating to receiving Treasury notes.

February 6, 1847.—Circular in relation to receiving scrip under act of August 6, 1846.

February 9, 1847.—Circular relating to the collection and safe keeping of the public revenue.

April 1, 1847.—Proclamation ordering sales at Mineral Point, in Wisconsin, with usual notice to claimants, &c.

April 3, 1847.—Proclamation, &c., in Arkansas, same as proclamation of August 12, 1846.

April 8, 1847.—Circular relating to official returns and commissions.

May 5, 1847.—Order requesting statement of all surveyed land in respective land districts.

May —, 1847.—Instructions under act of February 11, 1847, in relation to military bounty land warrants.

June 3, 1847.—Circular relating to forms and manner of locating warrants under act of February 11, 1847, and lands locatable therewith.

June 7, 1847.—Circular relating to certificates of Choctaw Indian claims.

June 17, 1847.—Circular relating to the security of public moneys.

August 6, 1847.—Circular in relation to State selections.

August 19, 1847.—Circular in relation to excesses in locations with Choctaw certificates. Sent to local offices in Mississippi, Louisiana, Alabama, and Arkansas.

October 1, 1847.—Circular relating to military bounty land warrants, under act of 1847.

October 9, 1847.—Proclamation ordering sales at Mineral Point and Green Bay, in Wisconsin, with usual notice, &c.
October 16, 1847.—Proclamation, &c., in Arkansas, same as proclamation of April 3, 1847.
October 26, 1847.—Circular in relation to printing blanks.
November 10, 1847.—Circular in relation to collecting fees in military bounty land warrant locations—expressly inhibited.
November 30, 1847.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury.
December 6, 1847.—Circular informing registers and receivers that they cannot become purchasers of, depositors, or agents for the sale of bounty land warrants or certificates, or any other class of scrip.
January 27, 1848.—Proclamation ordering sales to be held at Sault Ste. Marie, Mich., with usual notice, &c.
March 30, 1848.—Public notice to settlers under the armed occupation act, Florida.
April 1, 1848.—Circular in relation to military bounty land warrants under act of 1847.
April 7, 1848.—Notice of the establishment of a land office at Falls Saint Croix, in Wisconsin.
April 11, 1848.—Public notice to volunteers having pre-emption claims to Miami lands in Indiana.
April 16, 1848, and April 25, 1848.—Special instructions to local officers at Sault Ste. Marie, Mich., relating to their duties, classification of lands, &c.
May 8, 1848.—Proclamation, &c., at Falls Saint Croix and Green Bay, in Wisconsin, with the usual notice, &c.
June 19, 1848.—Proclamation, &c., at Jackson, in Missouri, with usual notice, &c.
June 19, 1848.—Proclamation, &c., at Iowa City and Dubuque, Iowa, with usual notice, &c.
July 3, 1848.—Proclamation, &c., at Fayetteville, Little Rock, Helena, and Johnson Court-House, in Arkansas, with usual notice, &c.
July 3, 1848.—Proclamation, &c., Newnansville and Tallahassee, Fla., with usual notice, &c.
July 3, 1848.—Proclamation, &c., at Opelousas and Ouachita, in Louisiana, with usual notice, &c.
July 8, 1848.—Proclamation, &c., at Sault Ste. Marie and Ionia, Mich., with usual notice, &c.
July 15, 1848.—Circular relating to compensation for entering locations of land warrants under act of 1847.
August 6, 1848.—Circular relating to State selections under act of 4th September, 1841.
August 17, 1848.—Circular under the law giving further time for satisfying claims for bounty lands, &c.
August —, 1848.—Instructions relating to act authorizing certain soldiers in late war with Great Britain to surrender the bounty lands drawn by them and to locate others in lieu thereof.
August 24, 1848.—Registers and receivers ordered to make returns immediately after close of each month and quarter.
August 28, 1848.—Circular of instructions in relation to location of military bounty land warrants.
September 23, 1848.—Notice of sales of improved lands in Ohio, ceded by the Wyandots in 1842.
December 13, 1848.—Annual report of the Commissioner of the General Land Office to the Secretary of the Treasury.

January 5, 1849.—Circular in relation to careful examinations of tracts applied for at local land offices prior to issuing certificates, and sales of each day to be kept correctly and posted in tract books.
February 7, 1849.—Proclamation ordering sales at Falls Saint Croix and Mineral Point, Wis.; with usual notice, &c.
February 7, 1849.—Proclamation, &c., at Milwaukee and Green Bay, Wis.; with usual notice, &c.
February 7, 1849.—Proclamation, &c., at Helena, Washington and Champagnole, Ark., with usual notice, &c.
February 7, 1849.—Proclamation, &c., at Springfield, Mo.; with usual notice, &c.
February 7, 1849.—Proclamation, &c., at Sault Ste. Marie and Ionia, Mich.; with usual notice, &c.
February 7, 1849.—Notice of establishment of a land office at Milan, in Missouri.
February 27, 1849.—Proclamation ordering sales at Falls Saint Croix and Mineral Point, Wis.; with the usual notice, &c.
February 27, 1849.—Proclamation, &c., at Natchitoches, Opelousas, and New Orleans, La.; with usual notice, &c.
February 27, 1849.—Proclamation, &c., at Newnansville and Saint Augustine, Fla.; with usual notice, &c.
February 27, 1849.—Proclamation, &c., at Fairfield and Dubuque, Iowa; with usual notice to settlers, &c.
March 2, 1849.—Notice of establishment of a land office at Willow River, Wis.
March 20, 1849.—Notice of removal of land office at Falls Saint Croix, Wis., to Stillwater, Minn.
March 30, 1849.—Notice of postponement of sales ordered at Falls Saint Croix, Wis.
May 14, 1849.—Notice of suspension of sales in Michigan.
May 16, 1849.—Notice of postponement of sales at Milwaukee, Wis.
June 13, 1849.—Circular relating to receivers accounts and deposits of public moneys.
June 23, 1849.—Circular respecting changes of entry under act of 3d of March, 1849, and the 24th of May, 1824. Rules to be observed in applications, &c.
July 23, 1849.—Circular respecting the changes of entry, &c.
September 7, 1849.—Notice of postponement of sales at Milwaukee, Wis.
September 10, 1849.—Additional instructions relating to receivers, accounts, &c.
September 15, 1849.—Proclamation ordering sales at Newnansville and Tallahassee, Fla.; with usual notice, &c.
September 15, 1849.—Proclamation, &c., at Genesee and Ionia, Mich.; with usual notice, &c.
September 15, 1849.—Proclamation, &c., Dubuque, Fairfield, and Iowa City, Iowa; with usual notice, &c.
September 15, 1849.—Proclamation, &c., Batesville, Fayetteville, and Little Rock, Ark.; with usual notice, &c.
September 15, 1849.—Proclamation, &c., Jackson, Springfield, and Clinton, Mo.; with usual notice, &c.
November 1, 1849.—Circular in relation to clerks employed in district land offices; form of oath; no fees to be collected by clerks, &c.
November 28, 1849.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.

December 11, 1849.—Notice of postponement of public sales ordered at Dubuque, Iowa.
June 1, 1850.—Rules prescribed in regard to furnishing exemplifications of patents, &c., by General Land Office.
June 13, 1850.—Proclamation ordering sales to be held at Sault Ste. Marie and Ionia, Mich.; with the usual notice to claimants, &c.
June 13, 1850.—Proclamation, &c., at Dubuque, Iowa City, and Fairfield, Iowa; with usual notice, &c.
November 21, 1850.—Circular in relation to reclaiming swamp lands.
November 30, 1850.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
January 18, 1851.—Circular relating to fragmentary surveys and bringing isolated tracts of land into market under the fifth section of act of August 3, 1846.
January 20, 1851.—Circular regarding official returns, communications, and indorsements, &c.
March 31, 1851.—Circular relating to bounty land warrants and location of the same.
April 20, 1851.—Circular under act authorizing the correction of erroneous locations of military bounty land warrants by actual settlers on public lands in certain cases.
April 25, 1851.—Circular relating to abstracts of warrants issued under act of September 28, 1850.
April 28, 1851.—Proclamation ordering sales to be held at Mineral Point, Wis., and Dixon, Ill.
April 28, 1851.—Proclamation, &c., Quincy and Dixon, Ill., with usual notice, &c.
April 28, 1851.—Proclamation, &c., Quincy, Danville, Dixon, Chicago, and Springfield, Ill., with usual notice, &c.
April 28, 1851.—Proclamation, &c., Chicago and Springfield, Ill., with usual notice, &c.
April 28, 1851.—Proclamation, &c., Willow River, Mineral Point, and Green Bay, Wis., with usual notice, &c.
April 28, 1851.—Proclamation, &c., Willow River, as preceding.
May 6, 1851.—Proclamation, &c., at Stillwater, Minn., with usual notice to claimants, &c.
May 6, 1851.—Proclamation, &c., Sault Ste. Marie, Ionia, Genessee, Detroit, and Kalamazoo, Mich., with usual notice, &c.
May 6, 1851.—Proclamation, &c., Batesville, Champagnole, Helena, and Little Rock, Ark., with usual notice, &c.
May 6, 1851.—Proclamation, &c., Iowa City, Fairfield, and Dubuque, Iowa, with usual notice, &c.
May 6, 1851.—Proclamation, &c., Jackson and Springfield, Mo., with usual notice, &c.
May 8, 1851.—Circular relating to warrants transmitted to local officers for location, form of certificate to be issued, &c.
July 17, 1851.—Notice of sale of improved lands in Ohio; lands ceded by the Wyandots in 1842.
July 19, 1851.—Circular in relation to employés of the General Land Office, biennial register, &c.
July 26, 1851.—Proclamation ordering sales at Saint Augustine, Newnansville, and Tallahassee, Fla., with usual notice, &c.
July 26, 1851.—Proclamation, &c., Sault Ste. Marie, Mich., with usual notice, &c.
August 14, 1851.—Circular relating to returns from local officers should be made immediately after the close of each month and quarter.

November 26, 1851.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
January 13, 1852.—Additional to circular of November 21, 1850, relating to swamp lands.
January 17, 1852.—Circular in relation to withholding certain lands in Alabama and Mississippi from market.
February 12, 1852.—Notice of discontinuance of land office at Fort Wayne, Ind.
April 2, 1852.—Circular relating to forms and regulations for the assignment of land warrants and locations, under act of March 22, 1852.
April 3, 1852.—Proclamation, &c., at Chicago, Danville, Dixon, Vandalia, Palestine, Shawneetown, and Kaskaskia, Ill., with usual notice, &c.
July 14, 1852.—Notice of removal of land office at Green Bay to Menasha, Wis.
July 28, 1852.—Notice of sales of improved lands in Ohio.
July 29, 1852.—Proclamation, &c., at Stillwater, Minn., with usual notice, &c.
August 4, 1852.—Circular relating to the assignment of warrants under act of 1850, by a Creek Indian.
August 10, 1852.—Proclamation, &c., at Mineral Point, Wis., also at Menasha and Willow River in said State, with notice, &c.
September 2, 1852.—Notice of establishment of three additional land offices in Iowa; Chariton, Fort Des Moines, and Kanesville.
September 14, 1852.—Circular instructions relating to charging fees for locating warrants.
September 16, 1852.—Circular relating to fees of registers and receivers.
October 14, 1852.—Circular relating to the assignment of bounty-land warrants.
November 4, 1852.—Proclamation, &c., at Greensburg, in Louisiana, with usual notice, &c.
November 29, 1852.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
December 20, 1852.—Circular prescribing rules and regulations for issuing scrip in satisfaction of Virginia military land warrants.
February 1, 1853.—Proclamation ordering sales to be held at Kanesville, Fort Des Moines, Chariton, and Dubuque, Iowa.
February 1, 1853.—Proclamation, &c., at Willow River, La Crosse, Stevens's Point, and Menasha, Wis., with usual notice, &c.
February 1, 1853.—Proclamation, &c., at Willow River, Stevens's Point, and Menasha, Wis., with usual notice, &c.
February 5, 1853.—Notice of discontinuance of the land office at Vincennes, Ind.
March 21, 1853.—Notice of establishment of land offices at Benicia and Los Angeles, Cal.
April 18, 1853.—Notice of postponement of sales in Wisconsin.
April 20, 1853.—Notice of reopening of land office at Vincennes, Ind.
April 20, 1853.—Circular relating to correction of erroneous locations with military bounty land warrants by actual settlers on public lands in certain cases.
April 30, 1853.—Notice to settlers in Oregon claiming the benefits of the donation act of September 27, 1850.
May 2, 1853.—Circular relating to powers of attorney, transfers, and assignments of claims.
May 18, 1853.—Proclamation ordering sales at Sault Ste. Marie and Genessee, Mich., with usual notice, &c.

May 23, 1853.—Proclamation, &c., at Saint Stephens, Demopolis, and Tuscaloosa, in Alabama, and Columbus and Augusta, Miss., with usual notices, &c.

June 21, 1853.—Proclamation, &c., at Willow River, Menasha, La Crosse, Stevens's Point, and Mineral Point, Wis., with usual notice, &c.

July 20, 1853.—Circular relating to transmission of all official returns and communications to General Land Office, indorsements, &c.

August 7, 1853.—Notice of discontinuance of land office at Crawfordsville, Ind.

August 17, 1853.—Circular in relation to rules and regulations to be observed in locations of Revolutionary bounty land scrip under act of August 31, 1852.

August 19, 1853.—Notice of withdrawal, from public sale or entry, of lands lying within 18 miles of the route of the proposed railroad from Brandon, in Mississippi, to Montgomery, in Alabama.

October 12, 1853.—Circular instructions to the registers and receivers in California under acts of March 3, 1853, the 4th of September, 1841, and acts supplementary.

October 17, 1853.—Circular relating to the assignment and location of land warrants under acts of 1850 and 1852, powers of attorney, &c.

November 7, 1853.—Construction of circular of July 20, 1853, in relation to transmission of official returns, &c.

December 17, 1853.—Notice of withdrawal of certain lands from sale in Louisiana for railroad purposes.

December 17, 1853.—Notice of withdrawal of lands along line of railroad between Shreveport, La., and Vicksburg, Miss.

December 17, 1853.—Notice of withdrawal of lands from Gain's Landing on the Mississippi River via Camden, and near Fulton, to the Texan boundary line, and branches from Camden.

January 19, 1854.—Circular relating to repayment and changes of entry referring to circulars of August 31, 1830, July 23, 1849, and April 20, 1853.

January 22, 1854.—Notice extending the time of reservation of lands heretofore withdrawn from sale along the route of the Cairo and Fulton Railroad and branches.

January 24, 1854.—Notice of withdrawal of certain lands in Alabama, along the proposed railroad to connect Chattanooga, Tenn., with Central Railroad of Mississippi, &c.

February 1, 1854.—Circulars to receivers relating to Treasurer's drafts.

February 14, 1854.—Circular relating to location of war of 1812 warrants.

February 14, 1854.—Notice of removal of land office from Sparta to Elba, Ala.

February 28, 1854.—Notice of withdrawal of certain lands in Alabama and Mississippi and Louisiana, for railroad purposes.

March 1, 1854.—Notice of removal of land office from Chillicothe to Columbus, Ohio.

March 6, 1854.—Circular relating to pre-emption rights in California under act of September 4, 1841.

March 7, 1854.—Notice of removal of surveyor-general's office from Oregon City to Salem, in Oregon.

March 15, 1854.—Notice of removal of surveyor-general's office, &c., as March 7, 1854.

March 28, 1854.—Notice of continuance of land office at Chillicothe, Ohio.

March 28, 1854.—Notice of withdrawal of certain lands along route of proposed North Missouri Railroad.
March 30, 1854.—Notice of withdrawal of certain lands in Florida and Alabama for railroad purposes.
April 5, 1854.—Public notice relating to relief of settlers on lands reserved for railroad purposes.
April 27, 1854.—Circular relating to depositories for public funds.
May 16, 1854.—Notice of withdrawal of certain lands in Michigan and Wisconsin for railroad purposes.
May 16, 1854.—Notice of establishment of a land office at Duncan, Mich.
May 18, 1854.—Proclamation ordering sales at Kanesville, Fort Des Moines, Dubuque, Chariton, Fairfield, and Iowa City, Iowa, with usual notice, &c.
May 18, 1854.—Proclamation ordering sales at Stevens Point, Willow River, Menasha, and Mineral Point, Wis.; also at La Crosse, in Wisconsin, with usual notice, &c.
May 18, 1854.—Proclamation ordering sales at Sault Ste Marie and Duncan, Mich., with usual notice, &c.
May 27, 1854.—Notice of sale of improved lands in Michigan, ceded by the Wyandots in 1842.
June 3, 1854.—Proclamation, &c., at Brownsville, Stillwater, and Minneapolis, Minn.
June 8, 1854.—Notice of withdrawal of certain lands in the State of Missouri for railroad purposes.
June 9, 1854.—Circular relating to preparation of accounts for suits.
June 10, 1854.—Notice extending time of the reservation of certain lands heretofore withdrawn from sale along the route of proposed railroad from Shreveport, La., to Vicksburg, Miss.
June 21, 1854.—Notice for restoring certain lands to market in the State of Missouri.
June 24, 1854.—Notice for restoring to private entry certain lands in Michigan, recently withdrawn for railroad purposes.
June 28, 1854.—Circular rescinding in part that of the 17th of May, 1845, relating to compensation for depositing.
July 15, 1854.—Notice of withdrawal of certain lands in Wisconsin, Iowa, and Minnesota, for railroad purposes.
July 18, 1854.—Circular suspending directions heretofore given in regard to amounts required to be deposited to credit of the Treasurer of the United States.
August 21, 1854.—Notice restoring certains lands to market in Wisconsin.
August 24, 1854.—Notice of establishment of suveyor-general's office at Santa Fé, N. Mex., Oregon City, Oreg., and Olympia, in Washington Territory; also of land offices at Winona and Red Wing, in Minnesota, Oregon City, in Oregon, and Olympia, in Washington Territory.
August 28, 1854.—Circular relating to occupancy of certain lands in Oregon and Washington Territory.
August 30, 1854.—Circular under graduation act of 1854.
August 31, 1854.—Circular relating to deposits by receivers and compensation for making the same.
September 5, 1854.—Notice restoring certain lands to market in Alabama, Mississippi, Louisiana, Iowa, Minnesota, and Wisconsin, heretofore withdrawn for railroad purposes.
September 15, 1854.—Notice of sale of certain alternate sections in

Missouri, sales to be held at Palmyra, Milan, and Plattsburg, with usual notice to settlers, &c.

September 15, 1854.—Proclamation ordering sales at Saint Louis, Jackson, Clinton, and Springfield, Mo., with usual notice, &c.

October 13, 1854.—Special notice of sales of certain alternate sections in Missouri, at Palmyra, Milan, and Plattsburg, &c.

October 13, 1854.—Proclamation, &c., at Saint Louis, Jackson, Clinton, and Springfield, Mo.

October 30, 1854.—Circular instructions under the graduation act of August 4, 1854.

November 30, 1854.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.

December 5, 1854.—Notice of sales of alternate sections in Missouri postponed.

January 25, 1855.—Notice of the discontinuance of the United States land offices at Jeffersonville, Vincennes, and Winamac, in Indiana.

February 6, 1855.—Notice of restoration and withdrawal of certain lands in the Cairo and Fulton Railroad grant, in Missouri.

February 7, 1855.—Proclamation, &c., at Augusta, Miss., and Demopolis, Ala., with usual notice, &c.

February 17, 1855.—Notice of temporary discontinuance of United States land office at Vincennes, Ind.

February 22, 1855.—Pamphlet—Manual of surveying instructions adopted by the General Land Office.

March 4, 1855.—Notice of establishment of office of surveyor-general at Salt Lake City, Utah Ter.

April 3, 1855.—Notice of withdrawal of certain lands in Wisconsin for canal purposes.

April 9, 1855.—Notice of establishment of a land office at Marysville, Cal.

April 26, 1855.—Circular relating to the impropriety of officers and agents of the Department of the Interior becoming interested in the traffic of military county land warrants.

April 28, 1855.—Notice of the establishment of a land office at Fond du Lac, Superior City, Wis.

April 30, 1855.—Notice of restoration and withdrawal of certain lands within the limits of grants to railroads in Arkansas.

May 1, 1855.—Circular under act of March 3, 1855, amendatory of graduation act of August 4, 1854.

May 3, 1855.—Circular relating to the assignment, transfer, and location of bounty land warrants under act of 1855.

May 15, 1855.—Notice of removal of land office from Clinton to Warsaw, in Missouri.

May 17, 1855.—Notice of establishment of a land office at Winchester, Oreg.

May 19, 1855.—Circular—additional instructions to those contained in circular of May 1, 1855, relating to entries under the graduation act of August 4, 1854.

June 9, 1855.—Notice of discontinuance of United States land offices at Palestine, Quincy, Edwardsville, Chicago, and Dixon, Ill.

June 18, 1855.—Notice of the discontinuance of the land office at Defiance, Ohio.

July 14, 1855.—Notice for the restoration to market of certain lands in Missouri.

July 20, 1855.—Proclamation, &c., Brownsville, Winona, Red Wing, Minneapolis, and Stillwater, Minn., with usual notice, &c.

September 1, 1855.—Notice of discontinuance of land office at Vincennes, Ind.
September 9, 1855.—Notice of reopening of the Danville land office, in Illinois, which had been closed since March 20, 1855.
September 22, 1855.—Notice of postponement of public sales at Brownsville, Winona, Red Wing, Minneapolis, Sauk Rapids, and Stillwater, Minn.
October 31, 1855.—Notice of the establishment of land offices at Decorah, Fort Dodge, and Sioux City, Iowa.
November 12, 1855.—Notice of discontinuance of land office at Shawneetown and Kaskaskia, in Illinois, Kalamazoo, Mich., Milwaukee, Wis., and Fairfield, Iowa.
November 26, 1855.—Notice of discontinuance of land offices at Omaha, Nebr., and Lecompton, Kans.
November 30, 1855.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
December 8, 1855.—Notice of discontinuance of land offices at Vandalia, Ill., and Springfield, Ill.
December 14, 1855.—Circular relating to adjoining farm entries under graduation act of August 4, 1854.
December 20, 1855.—Public notice in relation to swamp and overflowed lands.
December 21, 1855.—Public notice relative to bringing to a close the swamp land business under act of 28th of September, 1850.
December 24, 1855.—Circular relating to change of timber agencies—duties hereafter to devolve upon local officers.
January 23, 1856.—Circular relating to the issue of patents for entries under the graduation act of August 4, 1854.
January 23, 1856.—Circular to the officers of the Interior Department relating to leave of absence, &c.
January 24, 1856.—Circular relating to official hours at local land offices during press of business.
January 26, 1856.—Circular relating to the location of land warrants under act of 3d of March, 1855, and compensation of registers and receivers.
February 4, 1856.—Circular in relation to monthly returns.
February 11, 1856.—Circular relating to swamp selections, and proof required from contestants of the State's claim.
April 3, 1856.—Notice of removal of land office at Brownsville to Chatfield, Minn.
April 5, 1856.—Proclamation, &c., Sault Ste. Marie and Duncan, Mich., with usual notice, &c.
April 7, 1856.—Circular relating to rights of *bona fide* settlers under the graduation act of August 4, 1854.
April 15, 1856.—Notice of temporary continuance of land office at Kalamazoo, Mich.
April 15, 1856.—Notice of discontinuance of land office at Iowa City, Iowa.
April 20, 1856.—Notice of removal of land office at Cahaba to Greenville, Ala.
April 21 and 25, 1856.—Circulars relating to locations with land warrants, and fees received for the same.
May 5, 1856.—Notice of discontinuance of land office at Danville, Ill.
May 21; 1856.—Notice of withdrawal of lands in Iowa for railroad purposes.

May 23, 1856.—Notice of withdrawal of certain lands in Florida and Alabama for railroad purposes.
May 23, 1856.—Circular in relation to locations with land warrants on pre-emptions not assignable.
June 5, 1856.—Notice of sales of alternate sections in Arkansas and Missouri, and of restoration of certain heretofore withdrawn lands to market.
June 12, 1856.—Notice of withdrawal from market of certain lands in Wisconsin for railroad purposes.
June 13, 1856.—Notice of withdrawal of certain lands in Michigan for railroad purposes.
June 17, 1856.—Notice of removal of the land office at Lebanon to Centre, Ala.
June 18, 1856.—Notice of withdrawal of certain lands in Louisiana for railroad purposes.
June 20, 1856.—Notice of removal of the land office at Decorah to Osage, Iowa.
June 21, 1856.—Notice of withdrawal from market of certain lands in Alabama for railroad purposes.
June 24, 1856.—Notice restoring certain lands in Wisconsin to market.
August 11, 1856.—Circular forbidding surveyors-general from entering into contracts with relatives, &c.
August 14, 1856.—Proclamation, &c., at Fort Leavenworth, Kans.
August 15, 1856.—Notice of withdrawal of certain lands in Mississippi, Alabama, and Louisiana for railroad purposes.
September 9, 1856.—Notice of withdrawal of additional lands in Florida for railroad purposes.
October 3, 1856.—Notice of the establishment of two additional land offices, Buchanan and Ojibaway, in Minnesota.
October 23, 1856.—Notice of temporary removal of land office at Winona to Faribault, in Minnesota.
October 24, 1856.—Circular relating to pre-emption rights.
November 21, 1856.—Circular respecting fees upon pre-emption sales or locations.
November 22, 1856.—Notice of re-establishment of the land office at Vincennes, Ind.
November 29, 1856.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
December 3, 1856.—Circular in relation to pre-emption acts of 1841 and 1843.
December 15, 1856.—Proclamation, &c., at Osage, Fort Dodge, and Sioux City, Iowa.
January 5, 1857.—Synopsis of President's proclamation ordering sales to be held in Iowa, dated December 15, 1856, preceding.
January 14, 1857.—Notice of removal of land office at Genessee to East Saginaw, in Michigan.
January 16, 1857.—Notice of removal of land office at Benicia to San Francisco, Cal.
February 13, 1856.—Proclamation, &c., at Oregon City and Winchester, Oreg.
February 26, 1857.—Notices of sale of Indian trust lands in Kansas.
March 19, 1857.—Notice of removal of land office at Sault Ste. Marie to Marquette, in Michigan.
March 21, 1857.—Circular in relation to location of half-breed Dacotah or Sioux scrip, issued under the act of July 17, 1854—forms, &c.

March 21. 1857.—Circular in relation to entries under the graduation act of 1854.
April 11, 1857.—Notice of establishment of three additional land offices, Doniphan, Fort Scott, and Ogden, in Kansas.
April 11, 1857.—Notice of the establishment of a land office at Eau Claire, in Wisconsin.
April 13, 1857.—Notice of the establishment of three additional land offices, Brownville, Nebraska City, and Dakota City, in Nebraska.
April 13, 1857.—Notice of removal of the land office at Red Wing to Henderson, in Minnesota.
April 27, 1857.—Circular in relation to land-warrant locations, and fees received for the same.
May 14, 1857.—Circular in relation to settlers within the limits of the Choctaw cession of 1830.
May 18, 1857.—Notice of removal of the land office at Fayette to Boonville, in Missouri.
June 7, 1857.—Rules and regulations prescribed for the government of registers and receivers, respecting their monthly and quarterly returns.
June 30, 1857.—Circular relating to compensation for additional and indispensable clerical services in local offices.
July 7, 1857.—Circular relating to registers' and receivers' monthly returns, fee statements, &c.
July 27, 1857.—Notice restoring certain lands to market in Louisiana.
August 18, 1857.—Notice of removal of land office from Ojibaway to Otter Tail City, in Minnesota.
September 9, 1857.—Circular relating to right of pre-emption to contractors carrying mails through Territories west of the Mississippi River, under provisions of appropriation act of March 3, 1855.
September 16, 1857.—Proclamation, &c., at Los Angeles, San Francisco, and Marysville, Cal., with usual notice to settlers, &c.
September 16, 1857.—Proclamation, &c., Plattsburg, Palmyra, Milan, Saint Louis, Jackson, and Springfield, Mo., with usual notice, &c.
September 16, 1857.—Proclamation, &c., Henderson and Faribault, Minn., Indian lands.
November 24, 1857.—Circular relating to certificates issued by Indian agents to the mixed bloods of the Chippewas of Lake Superior, under the seventh section, second article of treaty concluded 30th of September, 1854, with the Chippewas.
November 30, 1854.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
December 3, 1857.—Notice of removal of land office at Duncan to island of Mackinac, Mich.
December 3, 1857.—Further notice of said removal.
December 8, 1857.—Notice of removal of land office at Minneapolis to Forest City, Minn.
December 24, 1857.—Notice restoring certain lands to market in Iowa,
December 29 ,1857.—Proclamation with usual notice, &c., ordering sales at Elba, in Alabama.
December 31, 1857.—Circular relating to receipt of Treasury notes under act of 23d of December, 1857.
January 15, 1858.—Proclamation, &c. See synopsis issued February 17, 1858—below.
February 16, 1858.—Notice restoring certain lands to market in Wisconsin.

February 17, 1858.—Synopsis of proclamation dated January 15, 1858, ordering sales at Osage, Fort Dodge, Sioux City, Council Bluffs, Dubuque, Fort Des Moines, and Chariton, in Iowa.
February 19, 1858.—Notice restoring certain lands to market in Alabama.
February 20, 1858.—Notice of postponement of sales ordered in Minnesota by proclamation 587, and dated September 16, 1857.
February 23, 1858.—Notice of removal of land office at Sauk Rapids to Saint Cloud, in Minnesota.
March 9, 1858.—Proclamation, with usual notice, &c., ordering sales at Monroe and Natchitoches, in Louisiana.
March 12, 1858.—Notice, restoring certain lands to market in Louisiana.
March 17, 1858.—Notice restoring certain lands to market in Alabama.
March 19, 1858.—Proclamation, &c., with usual notice, &c., at Lecompton and Kickapoo, Kans.
March 30, 1858.—Proclamation, &c., with usual notice, &c., at Brownsville, Nebraska City, and Omaha City, in Nebraska.
April 12, 1858.—Notice of removal of surveyor-general's office from Lecompton, Kans., to Nebraska City, Nebr.
May 4, 1858.—Notice restoring certain lands to market in Florida.
May 15, 1858.—Notice creating three additional land offices in California—Humboldt, Stockton, and Visalia.
May 27, 1858.—Proclamation, &c., with usual notice, &c., ordering sales of Indian lands at Henderson and Faribault, in Minnesota.
May 27, 1858.—Notice of postponement of public sales in the parishes of Madison and Carroll, in Louisiana, ordered by proclamation, dated March 9, 1858.
May 27, 1858.—Notice of postponement of sales in Kansas, ordered by proclamation, dated March 19, 1858.
May 28, 1858.—Notice of change of limits in the northeastern and northwestern land districts in Minnesota.
June 7, 1858.—Notice of the enlargement of the Detroit and Saginaw land districts in Michigan.
June 7, 1858.—Notice of removal of land office at the island of Mackinac to Traverse City, Mich.
June 8, 1858.—Notice restoring certain lands to market in Michigan.
June 26, 1858.—Decision of the Secretary of the Interior relative to town sites of Superior City and Waverly.
June 21, 1858.—Notice of closing land office at Vencennes, in Indiana.
June 30, 1858.—Proclamation, &c., sales at Humboldt, Marysville, Stockton, Visalia, San Francisco, and Los Angeles, in California, accompanied by usual notice, &c.
July 1, 1858.—Notice restoring certain lands to market in Florida.
July 16, 1858.—Proclamation, &c., sales at Monroe, in Louisiana, with usual notice, &c.
July 21, 1858.—Proclamation, &c., sales at Lecompton and Kickapoo, in Kansas, with usual notice, &c.
July 26, 1858.—Notice of postponement of sales ordered in Minnesota by proclamation bearing date the 27th of May, 1858.
August 11, 1858.—Circular relating to appeal from decision of local officers in contested pre-emption cases.
August 24, 1858.—Notice of discontinuance of land office at Palmyra, in Missouri.
August 24, 1858.—Notice of postponement of sales ordered to be held in Nebraska, by proclamation, dated March 30, 1858.

September 15, 1858.—Notice of discontinuance of land office at Mineral Point, in Wisconsin.
September 15, 1858.—Notice of postponement of sales in Kansas ordered by proclamation of July 21, 1858.
September 23, 1858.—Notice of removal of land offices from Faribault to Saint Peter and from Stillwater to Cambridge, in Minnesota.
September 27, 1858.—Notice of establishment of a land office at Santa Fé, in New Mexico.
October, 18, 1858.—Decision in the Portland City claim.
October 24, 1858.—Notice restoring certain lands to market in Alabama.
November 1, 1858.—Circular relating to title to lands warrants in certain cases.
November 17, 1858.—Notice restoring certain lands to market in Wisconsin.
November 30, 1858.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
December 21, 1858.—Notice of discontinuance of land offices in the Platte and Chariton districts, Plattsburg, and Milan, in Missouri, and the suspension of entries of land therein.
December 24, 1858.—Synopsis of proclamation ordering sales to be held at Eau Claire, Stevens's Point, Hudson, Superior City, Menasha, and La Crosse, in Wisconsin, accompanied by usual notice, &c.
January 7, 1859.—Proclamation and synopsis of same, ordering sales to be held at Cambridge, Minn., accompanied by usual notice to claimants, &c.
January 11, 1859.—Proclamation, &c., at Greensburg, La., with usual notice, &c.
January 24, 1859.—Circular relating to regulations in reference to appeals.
February 1, 1859.—Notice restoring certain lands to market in Michigan.
February 10, 1859.—Notice of continuance of land office at Vincennes, Ind.
March 12, 1859.—Circular relating to deposits by receivers and mileage.
March 17, 1859.—Notice restoring certain lands to market in Mississippi
March 22, 1859.—Proclamation, &c., sales at Jackson, Miss., with usual notice, &c.
March 22, 1859.—Proclamation, &c., sales at Kickapoo, Lecompton, and Ogden, Kans., with usual notice, &c., and synopsis.
March 22, 1859.—Proclamation, &c., sales at Brownsville, Nebraska City, Omaha City, and Dakota, Nebr., with synopsis.
March 28, 1859.—Notice of removal of land office at Buchanan to Portland, in Minnesota.
April 6, 1859.—Circular relating to compensation of district land officers.
April 9, 1859.—Notice of postponement part of sales ordered at Cambridge, Minn., by proclamation, dated the 7th of January, 1859.
April 24, 1859.—Notice of postponement of sales ordered to be held at Superior City, Wis., by proclamation, bearing date the 24th of December, 1858.
May 10, 1859.—Circular relative to briefing letters, &c., refers to circulars of July 20, and November 7, 1853.
May 10, 1859.—Circulars relating to requisitions in favor of receivers.
May 30, 1859.—Proclamation, &c., sales at Fort Dodge, and Sioux City, in Iowa, with usual notice, &c., and synopsis.

June 14, 1859.—Notice of discontinuance of the Dubuque, Chariton, and Turkey River land district, in Iowa.
June 16, 1859.—Notice of discontinuance of the Kalamazoo land district, in Michigan.
July 9, 1859.—Proclamation, &c., sales at Saint Cloud, Forest City, Henderson, Chatfield, Cambridge, and Portland, in Minnesota, and synopsis.
August 3, 1859.—Notice restoring certain lands to market in Alabama.
August 8, 1859.—Notice of removal of land office from Ogden to Junction City, in Kansas.
August 23, 1859.—Circular relating to scrip issued in satisfaction of confirmed private land claims under act of June 2, 1858.
September 3, 1859.—Notice respecting actual settlers on lands embraced in the President's proclamation of the 9th of July, 1859, ordering sales of lands at certain land offices in Minnesota.
September 10, 1859.—Circular relating to official returns, &c.
September 15, 1859.—Notice of removal of land office from Winchester to Roseburg, in Oregon.
September 17, 1859.—Notice restoring certain lands to market in Wisconsin.
September 23, 1859.—Notice of removal of land office at Augusta to Paulding, in Mississippi.
October 16, 1859.—Notice of discontinuance of Mississippi land district in Arkansas; office at Helena removed to Little Rock, Ark.
November 15, 1859.—Proclamation, &c., sales at Tallahassee, Newnansville, and Saint Augustine, in Florida.
November 30, 1859.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
December 3, 1859.—Notice of removal of surveyor-general's office from Salem to Eugene City, Oreg.
December 28, 1859.—Notice restoring certain lands to market in Louisiana.
January 31, 1860.—Proclamation, &c., at Opelousas and New Orleans, La., with usual notice, &c., and synopsis.
March 8, 1860.—Notice restoring certain lands to market in Alabama.
March 9, 1860.—Proclamation, &c., at Greenville, Demopolis, Elba, Saint Stephens, Montgomery, Tuscaloosa, Huntsville, and Centre, in Alabama, with usual notice, &c.
April 6, 1860.—Proclamation, &c., at Traverse City, Iowa, Detroit and East Saginaw, in Michigan, with usual notice, &c.
April 11, 1860.—Circular in relation to collecting statistics for annual report of the General Land Office.
April 12, 1860.—Proclamation, &c., Junction City and Fort Scott, Kans., with usual notice, &c.
April 12, 1860.—Proclamation, &c., at Brownsville, Nebraska City, Omaha City, and Dacotah City, in Nebraska, with usual notice, &c.
May 8, 1860.—Notice of continued reservation of certain lands in Iowa.
May 30, 1860.—Notice of removal of land office from Cambridge to Sunrise, Minn.
June 10, 1860.—Notice restoring certain lands to market in Michigan.
June 30, 1860.—Notice of removal of land office at Hudson to Falls Saint Croix, in Wisconsin.
July 7, 1860.—Proclamation, &c., at Saint Cloud, Henderson, and Forest City, in Minnesota, with usual notice, &c., and synopsis.
August 1, 1860.—Notice restoring certain lands to market in Michigan.

August 11, 1860.—Circular relating to the collection of statistics for annual report of General Land Office.
August 14, 1860.—Proclamation, &c., at Fort Dodge and Sioux City, Iowa, with usual notice, &c.
August 16, 1860.—Circular relating to salaries of receivers of public moneys.
August 21, 1860.—Proclamation, &c., at Fort Scott, Kans., with usual notice, &c.
August 24, 1860.—Notice of removal of land office at Superior City to Bayfield, Wis.
September 11, 1860.—Proclamation, &c., at Little Rock, Fayetteville, Clarksville, Washington, and Champagnole, Ark., with usual notice, &c.
September 12, 1860.—Notice of discontinuance of the northwestern land district in Mississippi; office at Grenada removed to Jackson, Miss.
September 19, 1860.—Proclamation, &c., at Saint Cloud, Forest City, Chatfield, Sunrise City, and Portland, in Minnesota, with usual notice, &c.
September 24, 1860.—Notice of removal of land office at Fayetteville, Ark., to Huntsville, Ala.
September 25, 1860.—Circular issued by the Treasury Department and sent to receivers for their information and government.
October 22, 1860.—Proclamation, &c., at Marysville, Stockton, Humboldt, Visalia, and San Francisco, Cal.
October 25, 1860.—Circular relating to final adjustment of private land claims in Florida, Louisiana, and Missouri.
November 29, 1860.—Annual report of the Commissioner of the General Land Office to the honorable Secretary of the Interior.
December 11, 1860.—Notice restoring certain lands to market in Wisconsin.
April 19, 1861.—Notice of establishment of a land office at Vancouver, in Washington Territory, as the Columbia River district, and at Vermillion for the Yankton district, in Dakota Territory.
May 20, 1861.—Notice of removal of the land office at Jackson to Ironton, Mo.
May 20, 1861.—Circular prescribing manner of arranging patents on hand at local offices so as to be instantly accessible.
June 14, 1861 —Notice of removal of surveyor-general's office from Nebraska City, Nebr., to Leavenworth, Kans.
June 27, 1861.—Circular prescribing rules and regulations to be observed in the examination of pre-emption claims.
July 15, 1861.—Notice of the discontinuance of the Saint Louis land district, in Missouri.
July 24, 1861.—Notice of removal of the land offices at Fort Scott to Humboldt, Lecompton to Topeka, and Kickapoo to Atchison, all in Kansas.
July 26, 1861.—Notice of removal of land office at Warsaw to Calhoun, in Missouri.
August 13, 1861.—Notice of removal of land office at Chatfield to Winnebago City, in Minnesota.
August 16, 1861.—Circular relating to consolidated land offices.
August 21, 1861.—Notice of removal of land office from Sunrise City to Taylor's Falls, Minn.
August 27, 1861.—Circular in relation to giving legal force and effect to assignments of land warrants.

November 13, 1861.—Notice of temporary removal of the land office at Humboldt to Mapleton, Kans.
November 29, 1861.—Annual report of the Commissioner of the General Land Office to the honorable Secretary of the Interior.
December 13, 1861.—Notice of discontinuance of the land office at Vincennes, Ind.
December 20, 1861.—Rules and regulations prescribed for the government of local officers in the purchase of stationery, &c.
December 26, 1861.—Circular respecting demand Treasury notes received in payment for public lands.
January 6, 1862.—Circular in relation to oath of allegiance to be taken by all persons claiming pre-emptions or donations of land and those taking contracts in the surveying service.
February 10, 1862.—Circular relating to information required as to the character and value of the public lands.
March 1, 1862.—Circular prescribing rules and regulations for issuing certified copies in lieu of lost or destroyed Revolutionary bounty land scrip.
March 29, 1862.—Notice restoring land office for the Osage district, Kansas, to the town of Humboldt, Kans.
May 10, 1862.—Circular relating to circular of January 6, 1862, oath of allegiance, &c.
May 28, 1862.—Proclamation, &c., at Oregon City and Roseburg, Oreg., with usual notice, &c.
May 30, 1862.—Proclamation, &c., at Stevens's Point, Wis., with usual notice, &c.
June 4, 1862.—Notice of repeal of graduation act of August 4, 1854, by section 3 of act of June 2, 1862.
June 5, 1862.—Circular instructions, issued by order of the Secretary of the Interior, under act of June 2, 1862, to prevent and punish fraud on the part of officers entrusted with making contracts with the government.
June 11, 1862.—Circular relating to act of May 20, 1862, to secure homesteads, &c.
June 27, 1862.—Circular relating to reception of township plats at local offices and filing declaratory statements.
August 21, 1862.—Circular instructions applicable to selections for school purposes in California.
October 1, 1862.—Notice of temporary removal of land office at Forest to Minneapolis, Minn.
October 8, 1862.—Circular of Treasury Department relative to tax on salaries sent to each receiver.
October 30, 1862.—Circular instructions in relation to steps necessary to be taken under the act of May 20, 1862, to secure homesteads to actual settlers, &c.
November 29, 1862.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
February 12, 1863.—Notice of discontinuance of the Western land district (office at Calhoun) in Missouri.
February 18, 1863.—Notice of change of boundaries in certain land districts in California, Humboldt, Stockton, and San Francisco.
February 26, 1863.—Circular relating to the returns required under the homestead act of May 20, 1862.
March 9, 1863.—Notice of discontinuance of the northwestern land district (office at Otter Tail City), in Minnesota.

March 11, 1863.—Notice of establishment of land offices at Golden City, Colo., and Carson City, Nev.
March 16, 1863.—Notice of the restoration to market of certain lands in Michigan.
March 20, 1863.—Proclamation, &c., at Vancouver and Olympia, in Washington Territory, Ionia and East Saginaw, in Michigan; Topeka and Humboldt, in Kansas; with usual notice to claimants, &c.
March 25, 1863.—Notice of discontinuance of the southwestern land district; office at Springfield, Mo.
April 4, 1863.—Notice of discontinuance of the Red Wing land district, in Minnesota; office at Henderson.
April 16, 1863.—Notice of discontinuance of the Pawnee land district, office at Topeka, Kans., and adjournment of the public sales ordered at Atchison.
May 4, 1863.—Circular relating to act donating lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts.
May 20, 1863.—Notice of postponement of order discontinuing the Pawnee land district, in Kansas, and of holding public sales under proclamation of March 25, 1863, at Topeka, Kans.
June 3, 1863.—Circular relating to promptness in transmitting monthly and quarterly returns by local officers.
August 25, 1863.—Notice restoring certain lands to market in Ohio.
October 22, 1863.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
October 23, 1863.—Notice of discontinuance of the Delaware land district, office at Atchison, in Kansas.
February 22, 1864.—Circular relating to the location of half-breed Dacotah or Sioux scrip issued under act of July 17, 1854.
April 18, 1864.—Circular relating to act of March 21, 1864, amendatory of the homestead law and fees, &c.
April 18, 1864.—Proclamation, &c., Minneapolis and Saint Cloud, Minn; with usual notice, &c.
June 1, 1864.—Circular instructions to United States surveyors-general relating to their duties and to the field operations of deputy surveyors.
June 4, 1864.—Notice of removal of land office from Golden City, Colo., to Denver, Colo.; modification of manual of February 22, 1855.
July 7, 1864.—Proclamation, &c., at Saint Cloud, Minn.; with usual notice, &c.
July 15, 1864.—Proclamation, &c., of lands embraced in the Winnebago Indian Reservation in Minnesota, at Saint Peter, Minn.
August 20, 1864.—Circular giving effect to the act of July 1, 1864, for the disposal of "coal lands" and of "town property" on the public domain.
October 3, 1864.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
March 1, 1865.—Circular relating to homestead privileges extended to persons on actual duty in the military or naval service of the United States.
March 13, 1865.—Circular relating to certificates issued under seventh section, second article, of treaty concluded 30th of September, 1854, with the Chippewas of Lake Superior.
April 26, 1865.—Circular in relating to the supplemental act approved March 3, 1855, for the disposal of coal lands and town property on the public domain.

April 26, 1865.—Notice of the discontinuance of the land office at Los Angeles, Cal.
June 8, 1865.—Circular in relation to the furnishing of certified copies of the records, papers on file, or plats in the General Land Office.
July 19, 1865.—Circular in relation to the purchase of public lands or the entry of the same under the pre-emption and homestead laws.
October 3, 1865.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
October 20, 1865.—Circular in relation to the disposal of coal lands and town property on the public domain.
November 10, 1865.—Notice of discontinuance of the Batesville, Champagnole, and Huntsville land offices, in Arkansas.
December 14, 1865.—Circular relating to the abandonment and relinquishment of homesteads.
January 19, 1866.—Circular relating to right to change a pre-emption into a homestead.
February —, 1866.—Reprint of circular of January 19, 1854, relating to cases of repayment, &c.
March 2, 1866.—Circular requiring promptness by receivers in making deposits.
March 30, 1866.—Notice of discontinuance of land offices at Greenville, Tuscaloosa, Demopolis, and Centre, Ala., and their consolidation at Montgomery and Huntsville, in said State.
April 3, 1866.—Notice of removal of land office at Minneapolis to Greenleaf, in Minnesota.
April 20, 1866.—Circular relative to taking proof when homesteads are commuted into cash entries and warrant locations under eighth section of homestead act.
May 4, 1866.—Circular instructions to surveyors-general in regard to constructing maps, &c.
May 5, 1866.—Circular in relation to pre-emption fees.
May 19, 1866.—Notice of re-establishment of the southwestern land district, office at Springfield, in Missouri.
May 26, 1866.—Notice of the consolidation of the Centre land district with the Montgomery land district, in Alabama.
May 30, 1866.—Circular relating to selections in satisfaction of railroad and other Congressional grants, with forms of verifications, &c.
June 9, 1866.—Circular relating to fees for filing declaratory statements, how to be accounted for, &c.
June 14, 1866.—Proclamation, &c., at La Crosse, Stevens's Point, Bayfield, Mensha, and Falls Saint Croix, Wis.; with the usual notice to claimants, &c.
June 25, 1866.—Circular relating to fee statements.
July 5, 1866.—Notice restoring certain lands to market in Iowa.
July 26, 1866.—Notice of discontinuance of land offices at Washington, Paulding, and Columbus, in Mississippi, and their consolidation at Jackson, in said State.
July 26, 1866.—Notice of the creation of the Le Grande land district, in Oregon, and change of boundaries of the Roseburg and Oregon City land districts, in said State.
August 1, 1866.—Notice restoring certain lands to market in Michigan.
August 25, 1866.—Circular relating to a filing on an odd-numbered section within railroad limits.
September 13, 1866.—Circular instructions to surveyor-general of California, in regard to act of July 23, 1866, to quiet titles, &c.
September 18, 1886.—Circular relating to Chippewa scrip not applicable

to unsurveyed lands—modification of previous circular on same subject.

September 25, 1866.—Circular in relation to disposal of public lands within the Southern land States, for homestead actual settlement, &c., under act of June 21, 1866.

September 28, 1866.—Notice of discontinuance of land offices at Greensburg and Opelousas, in Louisiana, and of their consolidation at New Orleans, and the reopening of the land office at Monroe and Natchitoches, in said State.

October 2, 1866.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.

January 14, 1867.—Circular in relation to mining claims under the act of 26th July, 1866.

January 24, 1867.—Circular relating to selections in satisfaction of railroad and other Congressional grants, &c.

February 16, 1867.—Notice of removal of land office from Saint Stephens to Mobile, in Alabama.

March 29, 1867.—Circular relating to repayments of purchase money, and payments by officers of the government to any person not known to have been opposed to the rebellion, and in favor of its suppression, prohibited, &c.; construction of joint resolution of March 2, 1867, by the department.

April 10, 1867.—Notice of establishment of a land office and surveyor-general's office at Helena, in Montana Territory.

April 11, 1867.—Notice of discontinuance of the land office at Elba, and its consolidation with Montgomery, in Alabama.

April 30, 1867.—Circular relating to correction of errors in entries of the public lands, forms, &c., applications of repayments, &c.

May 3, 1867.—Circular relating to cases where parties desire to commute entries by cash payments under eighth section of homestead act, by taking part of the premises and abandoning the residue.

May 8, 1867.—Notice of discontinuance of land offices at Saint Augustine, Newnansville, and Tampa, and their consolidation at Tallahassee, in Florida.

May 8, 1867.—Notice creating an additional land district in California with office at Sacramento, in said State.

May 11, 1867.—Notice creating new land district in Nevada with office at Austin and Belmont, in said State.

May 11, 1867.—Notice creating new land district in Idaho Territory with office at Lewiston, in said Territory.

May, 1867.—Reprint of circular of December 24, 1855, relating to timber agencies.

May, 1867.—Reprint of circular of July 23, 1849, relating to changes of entry, &c.

May 20, 1867.—Circular under joint resolution of March 2, 1867, oath of loyalty, &c., required in certain cases.

June 15, 1867.—Notice creating additional land district in Colorado with office at Fair Play, in said Territory.

June 25, 1867.—Circular supplemental to circular of January 14, 1867, relating to mining claims, &c.

August 28, 1867.—Notice of Sioux Indian lands at Saint Peters, Minn.

September 17, 1867.—General circular showing manner of proceeding to obtain title to public lands.

October 15, 1867.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.

November 30, 1867.—Circular relating to noting receipt of official plats at local land offices.
December 31, 1867.—Notice creating an additional land district in Colorado with office at Central City, in said Territory.
January 28, 1868.—Notice of sales of lands within the Osage Indian cession in Kansas.
April 18, 1868.—Notice of postponement of sales ordered in Kansas on January 28, 1868.
April 24, 1868.—Notice restoring certain lands to market in Michigan.
May 4, 1868.—Circular letter relating to collections for a cabinet of natural history.
May 12, 1868.—Letter of the Commissioner of the General Land Office to Hon. N. P. Banks in relation to the Alaska purchase.
May 15, 1868.—Circular relating to proper course to be adopted in the adjustment of final homestead entries.
May 16, 1868.—Circular relating to agricultural lands provided for in the tenth and eleventh sections of mining act prior to date of said act designated as mineral lands, and as excluded from survey and sale.
June 10, 1868.—Circular relating to surveys of islands in lakes or rivers in districts where office of surveyor-general has been discontinued.
July 7, 1868.—Notice of removal of land office from Omaha to West Point, from Nebraska City to Lincoln, and from Brownsville to Beatrice, in Nebraska.
September 14, 1868.—Circular relative to relinquishments of homestead entries where it is alleged that, prior to such entries, actual settlement existed by persons other than the homestead party.
September 21, 1868.—Circular instructions in reference to the act of May 2, 1867, for the relief of the inhabitants of cities and towns upon the public lands, and the act amendatory thereof, approved June 8, 1868.
November 5, 1868.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
November 28, 1868.—Circular in relation to prompt transmission of monthly returns, &c., by local officers.
February 4, 1869.—Proclamation, &c., at Eau Claire and Bayfield, in Wisconsin, with usual notice, &c.
March 10, 1869.—General circular showing manner of proceeding to obtain titles to the public lands—modification of general circular of September 17, 1867.
May 11, 1869.—Proclamation, &c., at Denver City, Colo.
June 7, 1869.—Notice of change of boundaries of the Aurora land district, in Nevada and California.
June 12, 1869.—Notice of re-establishment of the land office at Los Angeles, Cal.
June 25, 1869.—Notice of removal of the land office at Winnebago City to Jackson, Minn.
June 25, 1869.—Circular in relation to relinquished and abandoned homesteads.
July 7, 1869.—Circular relating to prior settlement and residence upon a tract of public land.
July 25, 1869.—Circular in relation to consolidated land offices.
August 12, 1869.—Notice of the re-establishment of the land office at Grand Island, Nebr.
August 18, 1869.—Circular in relation to local officers furnishing lists of articles of stationery, &c., required by them.

October 23, 1869.—Notice of discontinuance of the Monroe land district in Louisiana, and its transfer to New Orleans, in said State.
November 1, 1869.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
December 15, 1869.—Treasury Department circular relating to disbursing officers depositing and transferring moneys, &c.; sent to each receiver.
December 21, 1869.—Notice of removal of land office from Greenleaf to Litchfield, Minn.
January 18, 1870.—Notice of removal of land office at Saint Peter to New Ulm, in Minnesota.
January 20, 1870.—Notice of change of boundary line between the Austin and Carson City land districts, in Nevada.
February 10, 1870.—Notice to settlers on lands reserved for railroad purposes.
February 10, 1870.—Notice to settlers on lands not reserved for railroad purposes.
March 18, 1870.—Circular in relation to coterminous proprietors, where right of joint entry is admissible under certain cases, &c.
March 22, 1870.—Circular instructions respecting rights of pre-emption settlers on public lands.
March 22, 1870.—Notice to pre-emption settlers on unsurveyed lands, &c., within railroad limits settled upon prior to withdrawal.
March 30, 1870.—Circular respecting the assignment and location of bounty land warrants.
April 1, 1870.—Circular relating to the right of Indians to take up homesteads.
April 21, 1870.—Circular relating to homestead affidavits; how to be taken; qualifications, forms, &c.
April 26, 1870.—Circular relating to rights of parties having filed evidence of abandonment of homestead entries.
April 30, 1870.—Circular prescribing duties of registers and receivers in cases where parties have allowed the limitation allowed by law to expire without making final proof, under the homestead law, &c.
May 3, 1870.—Proclamation, &c., at Santa Fé, in New Mexico, and Denver City, Colo., with usual notice to settlers, &c.
June 14, 1870.—Circular in relation to evidence necessary to substantiate claims or demands against the government under joint resolution of March 2, 1867.
July 22, 1870.—Circular relating to the application of agricultural college scrip to pre-emptions.
July 25, 1870.—Circular relating to fees of registers and receivers in acting upon mining claims.
July 30, 1870.—Notice in relation to filing and payment by pre-emption settlers.
August 8, 1870.—Circular in relation to the survey and entry of lode and placer claims.
August 9, 1870.—Circular in relation to rights of soldiers and sailors under act of July 15, 1870, to a quarter section of alternate reserved sections along lines of railroads, &c.
August 23, 1870.—Circular relating to the manner of proceeding to obtain title to public lands by purchase, location with warrants or agricultural college scrip, &c., and by pre-emption and homestead.
August 27, 1870.—Circular relating to homesteaders before the expiration of the five years' residence, &c., required by the homestead act.

September 8, 1870.—Circular in relation to expense for depositing public moneys, &c.

October 8, 1870.—List of railroad concessions in the different States and Territories which have alternate sections reserved, subject to entry under the pre-emption and homestead laws.

October 13, 1870.—Proclamation, &c., at Taylor's Falls, Minn., with usual notice, &c.

October 27, 1870.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.

October 29, 1870.—Notice of removal of land office at Springfield to Bon Homme, Dakota.

December 5, 1870.—Circular relating to official returns, &c.

December 30, 1870.—Circular relative to treatment of pre-emption claims, under act of June 14, 1870—rules and regulations prescribed, &c.

January 5, 1871.—Decision, printed in pamphlet form, upon the survey of the claim of Daniel Clark, known as lot 104 of the old board of commissioners for adjusting claims to land in the Territory of Orleans.

January 7, 1871.—Order to employés in regard to approving cases for patents.

January 27, 1871.—Notice of discontinuance of the land office at Clarksville, Ark., and the restoration of two districts with offices at Harrison and Dardanelle; also of removal of Washington to Camden, in said State.

February 7, 1871.—Order to book-keepers in regard to their duties.

February 10, 1871.—Notice of enlargement of the Mobile land district, in Alabama.

February 10, 1871.—Regulations prescribing for the depositing of public moneys by receivers, &c.

March 6, 1871.—Circular relating to the twenty-fifth section of act of July 15, 1870, for the benefit of soldiers settling upon the public domain.

March 7, 1871.—Notice of enlargement of the Stockton land district, in California.

March 8, 1871.—Notice of enlargement of the Mobile land district, in Alabama.

March 10, 1871.—Notice creating two additional land districts in California, with offices at Shasta and Susanville.

March 23, 1871.—Notice of removal of land office at Junction City to Salina, Kans.

March 23, 1871.—Circular relating to act to further provide for giving effect to the various grants of public lands to the State of Nevada, approved June 8, 1868.

April—, 1871.—Circular relating to registers and receivers charging fees other than those allowed by law.

April 10, 1871.—Notice of establishment of an additional land district in Washington Territory with office at Walla Walla, in said Territory.

April 12 and 13, 1871.—Notices restoring certain lands to market in Michigan.

April 21, 1871.—Order of department to registers and receivers relative to suspending action on all applications of Chippewa or mixed bloods to enter lands under treaties with the Chippewas of Pembina and Red Lake.

April 26, 1871.—Circular relating to Osage Indian lands in Kansas.

May 1, 1871.—Circular relating to leaves of absence to surveyors-general

and registers and receivers, and who shall take charge of their respective offices pending their absence therefrom.

May 5, 1871.—Circular relating to pre-emptions under act of June 14, 1870—provisions extended to Colorado, &c.

May 6, 1871.—Circular giving effect to act of 3d of March, 1871, directing deposits made for the survey of public lands to go in part payment for the lands thus surveyed.

May 6, 1871.—Circular—supplemental instructions in relation to mineral and agricultural lands under the mining acts.

July 1, 1871.—Circular prescribing rules for the government of local land officers in preparing their monthly and quarterly returns to the General Land Office.

July 5, 1871.—Notice of change of boundaries of the land offices at Fair Play and Central City, in Colorado.

July 13, 1871.—Treasury circular relative to annual settlement of accounts, sent to registers and receivers.

July 17, 1871.—Circular relating to rights of appeal to Commissioner of the General Land Office from decisions rendered by registers and receivers.

August 2, 1871.—Circular relating to assignments on military bounty-land warrants.

August 3, 1871.—Circular relating to survey and entry of mining claims.

August 11, 1871.—Notice of removal of land office at Humboldt, to Independence, in Kansas.

August 23, 1871.—General circular, showing manner of proceeding to obtain title to public land, modified.

August 30, 1871.—Circular relating to postage on all official communications.

August 30, 1871.—Notice of change boundaries of land offices at Saint Cloud and Litchfield, in Minnesota.

September 7, 1871.—Circular relating to proof of citizenship of applicants for plats for mining claims, &c.

November 1, 1871.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.

November 7, 1871.—Circular relating to lands exempted from railroad grants.

November 10, 1871.—Notice of transfer of certain townships from the Marysville to the Shasta and Susanville land districts, in California.

December 12, 1871.—Notice of removal of land office from Augusta to Wichita, in Kansas.

January 5, 1872.—Circular in relation to the effect of selections by States under Congressional grants.

January 6, 1872.—Decision, printed in pamphlet form, in the case of the survey of the rancho "Corte de Madera Del Presidi."

January 26, 1872.—Decision, &c., relating to the Osage ceded lands, in Kansas.

January 27, 1872.—Notice of transfer of certain counties and parts of counties from Montgomery to Huntsville land district, in Alabama.

January 29, 1872.—Circular relating to requirements in applications to locate Sioux half-breed scrip on unsurveyed lands.

February 8, 1872.—Circular relating to agricultural college scrip being receivable in payment of pre-emption claims and commuted homesteads under eighth section, act of May 20, 1862.

February 17, 1872.—Circular relating to powers of surveyor-general of New Mexico to examine private land claims.

March 6, 1872.—Notice of removal of land office from Neodesha to Independence, in Kansas.
March 16, 1872.—Notice of change of boundaries of the Little Rock, Harrison, and Dardanelle land districts in Arkansas.
March 18, 1872.—Circular in regard to proof required in claims for indemnity under act of March 2, 1855, extended by act of March 3, 1857.
March 20, 1872.—Circular relating to manner of taking proof as to the mineral or agricultural character of lands, &c.
March 26, 1872.—Circular referring to circular of September 17, 1871, defining the manner of furnishing evidence of citizenship of claimants under the mining acts.
March 30, 1872.—Proclamation, &c., at Bayfield, Wis.
April 3, 1872.—Notice of the establishment of an additional land district in Minnesota, with office at Oak Lake, in said State.
April 3, 1872.—Notice of re-establishment of the Monroe land district, in Louisiana.
April 11, 1872.—Notice of the establishment of an additional land district in Nevada with office at Elko, in said State.
May 3, 1872.—Decision—pamphlet—in the matter of the California private land claim "Laguna de la Merced."
May 6, 1872.—Notice of sale of certain lands in Indiana.
May 13, 1872.—Notice of the establishment of an additional land district in Oregon, with office at Linkville, in said State.
June 5, 1872.—Circular respecting applications made by parties to be allowed to amend their respective homestead papers.
June 5, 1872.—Notice of the establishment of a land office at Redwood Falls, in Minnesota.
June 5, 1872.—Notice of the establishment of a land office at Yankton, in Dakota.
June 5, 1872.—Notice of the establishment of a land office at Cawker, in Kansas.
June 6, 1872.—Proclamation, &c., at Saint Cloud, Alexandria, and Duluth, in Minnesota, with usual notice, &c.
June 10, 1872.—Circular, in pamphlet form, relating to United States mining laws, and regulations prescribed thereunder.
June 12, 1872.—Decision, &c., in the matter of the California private land claim, "Guadalupe."
June 13, 1872.—Circular in relation to homesteads of soldiers and sailors, their widows and orphans, &c.
June 17, 1872.—Circular relating to the segregation of mineral and agricultural lands, and official correspondence relative to lands in the mineral region, which have been suspended from entry for agricultural purposes until shown to be non-mineral.
June 20, 1872.—Notice of removal of land office at Stevens Point to Wausau, Wis.
June 25, 1872.—Notice of establishment of additional land office at Gainesville, in Florida.
June 25, 1872.—Circular relating to filings on offered or unoffered lands and to act extending time for payment, &c.
June 27, 1872.—Circular relating to patents remaining on files of local land offices undelivered.
July 5, 1872.—Circular in reference to action to be taken by local officers in regard to lands within the limits of the reservation for the Ottawa and Chippewa Indians of Michigan.

July 8, 1872.—Notice of the change of boundaries of the Republican Valley, Nemaha, Western, and Grand Island land districts, in Nebraska.
July 15, 1872.—Circular instructions in regard to a certain class of cases arising under the act of June 8, 1872.
July 18, 1872.—Circular relating to adjudication of private land claims in Florida, Louisiana, and Missouri.
July 20, 1872.—Circular relating to act extending provisions of the pre-emption laws to the Territory to Colorado.
July 22, 1872.—Rules and regulations prescribed for posting returns from the district land offices.
August 7, 1872.—Circular relating to the disposal of the Cherokee Strip.
August 15, 1872.—Circular relating to lands exempted from railroad grants to which a valid pre-emption or homestead claim has attached.
August 26, 1872.—Circular relating to the issue of certificates of location by surveyors-general for private land claims in Louisiana, under act of June 2, 1858.
August 28, 1872.—Notice postponing sales in Minnesota, ordered 6th June last.
August 30, 1872.—General circular showing manner of proceeding to obtain title to the public lands.
September 12, 1872.—Circular in relation to restricting entries made on the same day, by same party, to one township and range, and not to exceed 640 acres.
September 15, 1872.—Rules prescribed for the government of local officers in the preparation of official returns.
September 24, 1872.—Decision, &c., in relation to private land claims La Carbonera and La Brea.
October 9, 1872.—Proclamation, &c., at Saint Cloud and Oak Lake, in Minnesota, with usual notice, &c.
October 17, 1872.—Circular in relation to relief of homestead settlers in Minnesota, Wisconsin, and Michigan.
October 26, 1872.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
November 8, 1872.—Decision, &c., upon the surveys of the ranchos Lompoc, La Purisima, Mission Vieja de la Purisima, and Canada de Salsipuedes.
February 3, 1873.—Circular relating to additional evidence required in cases, under provisions of acts prior to April 4, 1872, as amended by act of June 8, 1872.
February 4, 1873.—Notice withholding from sale or disposal, under any laws of the United States, all lands included in the award made by the Emperor of Germany October 21, 1872.
February 5, 1873.—Circular relating to applications for additional land under second section act of June 8, 1872.
February 11, 1873.—Circular relating to cases where applicants, under act of June 8, 1872, cannot furnish certified copies of discharge from the United States service.
February 25, 1873.—Circular directing deposits made for the survey of public lands to go in part payment for the lands thus surveyed.
March 1, 1873.—Notice of removal of land office at Aurora, Nev., to Independence, Cal., and of a change of boundaries in the Aurora and Carson City land districts, in Nevada, and the Visalia land district, in California.
March 5, 1873.—Circular relating to expenditures in mining claims.

March 15 and 18, 1873.—Circular relating to the approval of claims of Sioux half-breeds, or mixed bloods, of the Lake Superior band of Chippewas.

March 18, 1873.—Circular relating to first annual expenditures upon mining claims located prior to May 10, 1872, &c.

March 18, 1873.—Notice of removal of land office at West Point to Norfolk, in Nebraska.

March 20, 1873.—Notice of establishment of an additional land office in the Territory of Arizona, at Florence.

March 28, 1873.—Circular relating to how honorably discharged soldiers and sailors, their widows and orphans, may acquire additional homesteads on the public lands.

March 31, 1873.—Circular prescribing rules for the admission of joint entry by pre-emption settlers.

April 2, 1873.—Notice of removal of land offices from Austin to Eureka, and from Belmont to Pioche, and change of boundaries.

April 14, 1873.—Notice of change of boundaries of the Omaha and Grand Island land districts, in Nebraska.

April 15, 1873.—Notice of discontinuance of the East Florida land district, and removal of office from Gainesville to Tallahassee.

April 15, 1873.—Notice of discontinuance of land offices at Council Bluffs and Fort Dodge, in Iowa, and their consolidation at Des Moines, in said State.

April 15, 1873.—Pamphlet circular embracing the coal land laws and regulations thereunder.

April 16, 1873.—Notice of removal of land office at Vermillion to Sioux Falls, Dak.

April 20, 1873.—Circular relating to instructions under act of March 3, 1873, to encourage the growth of timber on western prairies.

April 21, 1873.—Circular instructions under act of March 3, 1873, relating to timber culture.

April 25, 1873.—Circular relating to postage on official communications.

April 25, 1873.—Circular relating to the confirmation of a class of entries which were allowed at the reduced price for settlement and cultivation under the graduation act of 1854, repealed by act of June 2, 1862.

April 30, 1873.—Notice of sales of detached tracts in Wisconsin to be held at Eau Claire.

May 3, 1873.—Decision in case of Saint Clair *v.* Western Pacific Railroad Company.

May 13, 1873.—Notice of change of boundaries of the western land district, office at North Platte, in Nebraska.

May 17, 1873.—Circular relating to cases where parties having filed homestead declaratory statements under provisions of act of June 8, 1872, have failed to make entry within six months from date.

June 1, 1873.—Modification of order of May 13, 1873.

June 2, 1873.—Notice of revocation of order discontinuing the east Florida land district office at Gainsville and its consolidation with the Tallahassee land office.

June 2, 1873.—Notice of the discontinuance of land office at Tallahassee and consolidation at Gainesville, Fla.

June 30, 1873.—Circular relating to modification of instructions issued under act to encourage the growth of timber on the western prairies, approved March 3, 1873.

July 8, 1873.—Circular in relation to selections made by California for agricultural colleges, &c., under act of July 2, 1862.

July 15, 1873.—Circular letter relative to mineral lands.

July 24, 1873.—Circular relating to the establishment of corners of public surveys by mounds of earth with deposits, &c.

September 8, 1873.—Circular relating to applications made by a railroad company to select land on which homesteads and pre-emption have been heretofore made and canceled for abandonment or relinquishment.

September 13, 1873.—Notice of removal of land office from Oak Lake to Detroit, Minn.

October 17, 1873.—Circular in modification of instructions of January 23, 1867, relative to sections in satisfaction of railroad and other Congressional grants, with forms for verification of lists, of selections, and also of plats of survey of such roads.

October 20, 1873.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.

October 30, 1873.—Circular instructions relating to act of March 3, 1873, in growth of timber on western prairies.

November 3, 1873.—Circular relating to applications to enter additional land under the provisions of act of June 8, 1872, as amended by act of March 3, 1873.

November 15, 1873.—Circular in relation to relinquished receipts, like other evidence of abandonment, to be regularly reported by registers and receivers, with their opinion, before final action of General Land Office.

November 20, 1873.—Circular relating to duties of deputies in surveying mining claims.

November 25, 1873.—Decision respecting the rancho Cuyamacca.

December, 1873.—Abstract printed of the more important acts of Congress making grants, reservations or appropriations of public lands in behalf of States, corporations, individuals, &c., which acts would be impliedly repealed by the education bill.

December 20, 1873.—Notice relating to parties having initiated entries under the homestead law allowing time to expire without making final proof, to be notified of their non-compliance with the law, and permitted certain time to show cause why their claims should not be forfeited or canceled, &c.

January 5, 1874.—Notice of removal of land office at Pembina to Fargo, in Dakota.

January 15, 1874.—Circular instructions in cases of contested swamp selections.

February 20, 1874.—Notice of enlargement of San Francisco, Cal., land district.

February 24, 1874.—Notice of removal of land office at Jackson to Worthington, Minn.

February 26, 1874.—Notice restoring certain lands to market in Kansas.

March 16, 1874.—Notice of establishment of an additional land office at La Mesilla, in New Mexico.

March 23, 1874.—Notice of transfer of certain townships from the Marysville to the San Francisco land district, in California.

March 26, 1874.—Circular relating to Bitter Root Valley Indian lands.

April 6, 1874.—Circular instructions under the timber culture act of March 13, 1874.

May 16, 1874.—Notice of restoration of certain lands to market in Michigan, issued in lieu of notice dated the 26th of February last.

June 9, 1874.—Circular relating to the requirements in regard to the first annual expenditures upon mining claims.

June 10, 1874.—Circular relating to pre-emptors on offered and unoffered lands, including lands in Fort Ridgely and Sioux Indian Reservations, in Minnesota, whose claims were initiated prior to June 3, 1874.

June 17, 1874.—Circular instructions for the government of local officers in receiving applications to file or locate scrip, issued by the General Land Office to Thomas B. Valentine under act of April 3, 1872, &c.

June 24, 1874.—Notice of establishment of land office at Bismarck, Dak.

July 6, 1874.—Circular relating to discrepancies and errors of various kinds in monthly returns from local officers.

July 6, 1874.—Notice of removal of land office from Lowell to Bloomington, in Nebraska.

July 9, 1874.—Circular relating to relief for settlers in certain portions of the States of Minnesota and Iowa who suffered by the grasshopper ravages.

July 13, 1874.—Circular relating to the survey of the beds of meandered lakes or other similar bodies of water where the office of surveyor-general has been abolished.

July 13, 1874.—Notice of establishment of land office at Bozman, in Montana.

July 18, 1874.—Circular instructions in relation to sale of Bitter Root Valley Indian lands.

August 5, 1874.—Circular relating to affidavits of persons entitled to additional entry under act of June 8, 1872, as amended by act of March 3, 1873; can be made before clerks of courts and transmitted by mail; personal attendance not necessary.

August 12, 1874.—Notice of establishment of land offices at Larned and Hays City, in Kansas.

August 12, 1874.—Circular instructions under the act of June 22, 1874, for the relief of settlers on railroad lands.

August 15, 1874.—Circular instructions relating to the Kansas trust and diminished reserve lands under act of June 23, 1874.

August 17, 1874.—Modification of circular of instructions in regard to relief for settlers whose crops have suffered by grasshoppers in certain counties in Iowa and Minnesota.

September 5, 1874.—Notice of establishment of land office at Del Norte, in Colorado.

September 5, 1874.—Notice of change of boundary of the land office at Fair Play, in Colorado.

September 8, 1874.—Circular relative to selections in certain fractional townships in Missouri for support of schools under act of June 4, 1874.

September 9, 1874.—Circular instructions relating to homestead entries where time had elapsed for making final proof.

September 16, 1874.—Circular relating to issuing duplicate agricultural college scrip where original has been lost or destroyed, under act of June 25, 1874.

October 3, 1874.—Circular relating to sale of certain Kansas Indian lands.

October 8, 1874.—Circular relating to location of scrip issued in satisfaction of private land claims in the States of Florida, Louisiana, and Missouri, with forms, &c.

October 15, 1874.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.

November 7, 1874.—Notice of removal of land office from Cawker City to Kirwin, Kans.

November 12, 1874.—Notice relative to location of Sioux half breed scrip by heirs of deceased scripee.
November 25, 1874.—Notice of removal of United States surveyor-general's office from Eugene City to Portland, Oreg.
December 1, 1874.—Circular instructions relating to surveys of islands in lakes or rivers in districts where the office of surveyor-general has been abolished.
December 9, 1874.—Order relating to inspection of records, &c., by attorneys.
January 5, 1875.—Circular instructions under act of December 28, 1874, for the relief of certain pre-emption and homestead settlers whose crops were destroyed or seriously injured by grasshoppers in 1874.
February 5, 1875.—Circular instructions relative to method of facilitating the settlement of contests, and the final adjudication of cases in which hearings have been held before the local officers.
February 12, 1875.—Notice of the establishment of an additional land office at the city of Dallas, Oreg.
March 5, 1875.—Circular relating to requirements of section 2324 Revised Statutes in regard to expenditures of mining claims, modified, &c.
March 18, 1875.—Circular instructions under act of March 3, 1875, amendatory of an act for the restoration to homestead entry and to market of certain Indian lands in Michigan.
March 23, 1875.—Circular in relation to proof required to obtain relief for actual settlers upon rejected swamp lands in the State of Missouri, under act of February 23, 1875.
March 25, 1875.—Circular relative to proof of abandonment and entry to be made by Indians under first section, act of March 3, 1875.
April 5, 1875.—Notice of removal of land office from Dakota City to Niobrara, in Nebraska.
April 8, 1875.—Circular relating to desert lands in Lassen County, California.
April 12, 1875.—Circular relating to local officers charging and receiving fees and commissions other than those allowed by law.
April 16, 1875.—Circular relating to powers of attorney.
May 11, 1875.—Modification of circular of January 5, 1875, extending relief to settlers on the public lands who suffered by the ravages of the grasshoppers.
June 1, 1875.—Circular instructions relative to certified lists of railroad selections for approval.
June 17, 1875.—General circular, showing manner of proceeding to obtain title to public lands.
June 17, 1875.—Circular relating to act of 3d of March, 1875, for the relief of settlers on lands within railroad limits.
June 24, 1875.—Circular instructions relating to the adjustment of railroad grants embodying regulations in force on 24th June, 1875, with forms for verification of lists and also of plats of survey, &c.
July 7, 1875.—Decision in case of The State of Iowa *v.* The Cedar Rapids, &c.
July 20, 1875.—Circular relating to agricultural college scrip.
July 20, 1875.—Circular relating to the location and assignment of bounty land warrants.
July 20, 1875.—Circular prescribing rules and regulations for issuing Revolutionary bounty land scrip, and for certified copies in lieu of lost scrip.

July 20, 1875.—Circular relating to certified copies, fees, &c.
August 3, 1875.—Notice, dated February 4, 1873, withholding certain lands, to cease, and lands therein described opened to sale as other public lands of the United States.
August 24, 1875.—Circular relating to school sections in California.
September 15, 1875.—Circular relative to the location and assignment of scrip issued under the decrees of the United States Supreme Court, pursuant to acts of June 22, 1860, and March 3, 1867, and June 10, 1872.
November 1, 1875.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
February 10, 1876.—Notice of transfer of certain townships from Republican Valley to Western land district, in Nebraska.
May 1, 1876.—Circular relating to the assignment of certain certificates of location issued by the surveyor-general of Missouri, and the Commissioner of the General Land Office as ex-officio surveyor-general for said State.
May 3, 1876.—Circular relative to the method of proceeding by a party who has made entry under the timber culture act of March 13, 1874, desiring to relinquish such entry in whole or in part with a view of taking it under the homestead laws.
May 4, 1876.—Circular in relation to furnishing list of articles of stationery, &c., annually required by local officers.
May 6, 1876.—Notice of establishment of land office at Beaver City, Utah.
May 18, 1876.—General circular showing manner of proceeding to obtain title to public lands.
May 22, 1876.—Circular relating to frauds in soldiers' additional homestead entries under section 2306, Revised Statutes; proof of examination hereafter required, &c.
June 21, 1876.—Notice of removal of land office from Litchfield to Benson, in Minnesota.
July 12, 1876.—Circular modifying circular of May 22, 1876, relating to frauds, &c.
July 19, 1876.—Circular relating to act of July 22, 1876, repealing section 2303, Revised Statutes, restricting the disposition of public lands in the Southern States to homestead entries.
July 21, 1876.—Circular relating to an act excluding the States of Missouri and Kansas from the provisions of act of May 10, 1872, to promote the development of the mining resources of the United States; non-mineral affidavits not hereafter required.
August 14, 1876.—Circular relating to act to confirm pre-emption and homestead entries made within the limits of railroad grants in cases where such entries have been made under the regulations of the land department.
August 23, 1876.—Circular instructions to registers and receivers, their clerks, employés, and those intimately and confidentially, related to them, that they are not permitted under any circumstances to make any entries of public land at the district offices over which they have control.
September 24, 1876.—Circular of May 17, 1873, so modified as to dispense with the oath required, when party has failed to make entry within six months from date of filing.
September 18, 1876.—Notice of removal of land office at Alexandria to Fergus Falls, in Minnesota.
September 25, 1876.—Circular relating to transmittal of official returns and communications.

October 24, 1876.—Circular relating to time for proof and payment by pre-emptors whose crops were destroyed or seriously injured in 1875, &c.

November 1, 1876.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.

November 17, 1876.—Order prohibiting attorneys and others from examining records of General Land Office, except in room provided for that purpose.

November 22, 1876.—Order to whom it may concern that information respecting any tract of land already patented can only be given by exemplified copies.

November 28, 1876.—Order to heads of divisions to furnish to receiving clerk list of all unpaid charges for certified copies furnished since July 1, 1876.

January 9, 1877.—Circular relating to requirements of claimants, under the timber culture act of March 13, 1874, as to breaking ten acres of land within a year from date of entry, &c.

January 22, 1877.—Circular relating to rules of practice before the General Land Office.

January 23, 1877.—Rules and regulations adopted by the General Land Office, with the approval of the Secretary of the Interior, in regard to proof required in claims for indemnity under act of March 3, 1855, extended by act of March 3, 1857.

January 30, 1877.—Circular instructions forbidding surveyors-general to employ deputy mineral surveyors as clerks or draughtsmen in their offices.

February 1, 1877.—Pamphlet embracing the United States mining laws, and regulations thereunder.

March 12, 1877.—Notice of removal of land office at Gainesville to Jacksonville, Fla.

March 12, 1877.—Circular instructions, under act of March 3, 1877, providing for the sale of desert lands in certain States and Territories.

March 19, 1877.—Circular amendatory of circular dated and approved by the Secretary of the Interior.

August 14, 1877.—Concerning entries of land within the limits of railroad grants; act of April 21, 1876.

March 21, 1877.—Notice of establishment of the Whitman land district office at Colfax, in Washington Territory.

March 27, 1877.—Notice relating to the admission of entries by the Commissioner of the General Land Office in States where there are no district land offices.

April 4, 1877.—Circular in relation to proof required in homestead cases under act of March 3, 1877.

April 10, 1877.—Circular relating to sales of saline lands under act of January 12, 1877.

April 11, 1877.—Notice of the establishment of the Black Hills land district office at Sheridan, in Dakota.

April 14, 1877.—Notice of the establishment of the Evanstown land district, with office at Evanstown, in Wyoming.

April 17, 1877.—Notice of the establishment of the San Juan land district, with office at Lake City, in Colorado.

April 25, 1877.—Circular respecting the limits of reservations for town sites upon the public domain.

May 2, 1877.—Circular in relation to changing the method formerly adopted for protecting the timber on the public lands, as per circular of December 24, 1855.

May 8, 1877.—Circular in regard to proof required in homestead entries under section 2291, Revised Statutes.
May 15, 1877.—Circular relating to applications for the amendment of declaratory statements in description of tracts or in date of alleged settlement.
May 17, 1877.—Circular relating to soldiers' additional homestead.
May 18, 1877.—Circular relating to returns by local officers of disposals of public lands.
May 24, 1877.—Notice of removal of land office at Sheridan to Deadwood, in Dakota.
June 6, 1877.—Notice revoking order for removal of land office from Gainesville to Jacksonville, Fla.
June 12, 1877.—Notice of removal of land office from Linkville to Lake View, in Oregon.
June 15, 1877.—Circular instructions relating to weekly reports of public funds by receivers.
June 19, 1877.—Notice of discontinuance of land office at Beaver City, in Utah.
June 19, 1877.—Circular in relation to indemnity school selections in California.
June 23, 1877.—Circular in relation to relief for settlers whose crops were destroyed or seriously injured by grasshoppers.
June 23, 1877.—Proclamation, &c., at Harrison, Ark., with usual notice, &c.
July 2, 1877.—Proclamation, &c., at Little Rock, Ark., with usual notice, &c.
July 18, 1877.—Notice of consolidation of Pioche and Elko land office, with office at Eureka, in Nevada.
August 10, 1877.—Order relating to registers and receivers referring letters addressed to them for official information to attorneys and outside parties.
October 8, 1877.—Proclamation ordering sales, &c., at Little Rock, Ark., with usual notice, &c.
October 8, 1877.—Proclamation, &c., Dardaneville, Ark., with usual notice, &c.
October 8, 1877.—Proclamation, &c., Camden, Ark., with usual notice, &c.
October 17, 1877.—Notice fixing boundary line of the Evanston land district, in Wyoming.
November 1, 1877.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
November 13, 1877.—Circular in relation to care and accuracy in the preparation of field notes of survey by deputy mineral surveyors.
December 1, 1877.—General circular showing methods of proceeding to obtain title to the public lands under existing laws.
December 28, 1877.—Circular in relation to notices of contests before district land officers being published in a newspaper designated by one of the parties to the contest.
December 31, 1877.—Notice of the discontinuance of land office at Independence, Cal., and transfer of business to Visalia.
December 31, 1877.—Notice of the discontinuance of the Sioux City land office and transfer of its business to Des Moines, Iowa.
January 8, 1878.—Circular relating to a practice prevailing at many district land offices of admitting entries and filings upon papers prepared and left in the hands of the registers and receivers and of attor-

neys practicing before them prior to the cancelation of an invalid entry under a pending contest or relinquishment, &c.

February 6, 1878.—Notice of removal of land office at Ionia to Reed City, in Michigan.

February 12, 1878.—Decision, in pamphlet form, relating to Wolf Lake, in Illinois.

February 21, 1878.—Treatise on the magnetic declination, or variation of the needle.

March 9, 1878.—Circular in relation to granting to railroads the right of way through the public lands of the United States.

March 21, 1878.—Circular relating to commutations of pre emption filings to homestead entries by parties wishing to avail themselves of the act of March 3, 1877, for the relief of settlers on the public lands, &c.

March 27, 1878.—Notice of transfer of certain townships from the San Francisco land district to the Humboldt land district, in California.

April 18, 1878.—Notice of removal of the land office at Independence to Bodie, in California.

May 1, 1878.—Notice of removal of land office at Detroit to Crookston, in Minnesota.

May 8, 1878.—Notice of discontinuance of land office at Traverse City, Mich., and transfer of business to Reed City, in said State.

May 28, 1878.—Circular respecting the location of Dacotah or Sioux half-breed scrip under act of July 17, 1854.

June 12, 1878.—Circular relating to the publication of notices of contest under the homestead pre-emption and timber culture laws under act of June 3, 1878.

June 25, 1878.—Circular relating to the sale of desert lands in certain Territories under act of May 3, 1877.

June 27, 1878.—Circular relating to disposal of public lands for purposes of timber culture, &c.

July 1, 1878.—Order to clerks of the General Land Office relating to their duties, &c.

July 2, 1878.—Order relating to duties of heads of divisions in General Land Office, &c.

July 6, 1878.—Circular relating to relief for certain settlers who left their settlements in 1876 because their crops were destroyed or seriously injured by grasshoppers.

July 8, 1878.—Circular relating to stationery for local offices, &c.

July 13, 1878.—Proclamation, &c., sales at Gainesville, Fla., with usual notice, &c.

July 13, 1878.—Proclamation, &c., Jackson, Miss., with usual notice, &c.

July 17, 1878.—Circular in relation to new forms for taking pre-emption and final homestead proof.

July 27, 1878.—Proclamation, &c., at Montgomery, Ala., and notice, &c.

July 27, 1878.—Proclamation, &c., Mobile, Ala., and notice, &c.

August 7, 1878.—Proclamation, &c., Jackson, Miss., with usual notice, &c.

August 7, 1878.—Circular instructions governing the repayment of purchase money for lands erroneously sold.

August 8, 1878.—Circular relating to changes of entry.

August 12, 1878.—Rules and regulations in regard to proof required in claims for indemnity under act of March 2, 1855, extended by act of

March 3, 1857, for swamp and overflowed lands sold by the United States prior to March 3, 1857.

August 13, 1878.—Circular relating to timber lands in California, Oregon, Nevada, and Washington Territory, under act of June 3, 1878.

August 15, 1878.—Circular in relation to cutting and removing timber from the public lands; review of act of June 3, 1878.

September 3, 1878.—Pamphlet instructions in the matter of the application of Nelson Dudymott to be allowed to make pre-emption filing upon certain lands in Kansas within the limits of the grant to the Kansas Pacific Railway Company.

September 13, 1878.—Circular relating to surveys and plats of mineral claims.

September 20, 1878.—Modification of rules in the adjudication of certain contested cases.

September, 1878.—General instructions to registers and receivers in relation to their duties.

October 1, 1878.—General circular showing manner of proceeding to obtain title to public lands under existing laws.

October 5, 1878.—Proclamation, &c., ordered July 13, 1878, to be held at Gainesville, Fla., postponed on account of ravages of yellow fever.

October 9, 1878.—Rules of practice, pamphlet form, prescribed in relation to cases before the United States district land offices, the General Land Office, and Department of the Interior.

October 28, 1878.—Annual report of the Commissioners of the General Land Office to the Secretary of the Interior.

October 28, 1878.—Proclamation, &c., sales ordered at Topeka and Independence, Kans., with usual notice, &c.

November 7, 1878.—Notice of discontinuance of land office at Monroe, La., and transfer of business to New Orleans.

December 11, 1878.—Circular relating to leave of absence asked for by surveyors-general and local land officers.

December 16, 1878.—Circular relating to attorneys representing parties in interest filing oath, &c.

December 16, 1878.—Circular relating to applications for forms.

December 24, 1878.—Proclamation, &c., ordering sales at Gainesville, in Florida, with usual notice, &c.

January 13, 1879.—Circular relating to the investigation of cases of trespass, forms of report, &c.

January 20, 1879.—Circular relating to promptness in reporting mineral entries.

January 25, 1879.—Proclamation, &c., ordering sales at Gainesville, Fla., with usual notice, &c.

January 30, 1879.—Circular relating to the location of Cole's scrip or warrants.

January 31, 1879.—Circular relating to scrip issued under the decrees of the Supreme Court of the United States.

February 13, 1879.—Circular, in pamphlet form, respecting the location and assignment of scrip issued under the decrees of the United States Supreme Court under acts of June 22, 1860, May 2, 1867, and June 10, 1872, and scrip issued under act of June 2, 1858.

February 20, 1879.—Proclamation, &c., ordering sales at New Orleans, La., with usual notice, &c.

March 8, 1879.—Circular relating to the return of certain military bounty land warrants.

March 12, 1879.—Notice of the establishment of the Oneida land district with office at Oxford, Idaho.

March 15, 1879.—Circular relative to issue of military bounty land warrants.

March 24, 1879.—Circular relating to act of March 3, 1879, granting additional rights to homestead settlers on public lands within railroad limits.

March 29, 1879.—Circular relating to investigation of trespass cases reported, &c., vouchers and accounts to be rendered.

April 1, 1879.—Pamphlet embracing the laws of the United States relating to mines and mining with the rules and regulations thereunder.

April 7, 1879.—Notice of discontinuance of the Mobile land office and transfer of business to Montgomery, Ala.

April 11, 1879.—Notice of the rearrangement of the boundaries of land districts in Dakota and removal of the Springfield office to Watertown.

April 14, 1879.—Notice of removal of land office at Fair Play to Leadville, Colo.

April 15, 1879.—Circular relating to new requirement as to giving notice of intention to prove up homestead and pre-emption claims.

May 8, 1879.—Circular relating to returns of locations made with private land scrip.

May 8, 1879.—Proclamation, &c., ordering sales at New Orleans, La., with usual notice, &c.

May 23, 1879.—Modification of circular of August 28, 1878.

May 24, 1879.—Circular in relation to fees for reducing testimony to writing, &c.

June 13, 1879.—Circular relating to requisitions for stationery, &c.

June 27, 1879.—Circular relating to certificates of deposits made on account of surveys.

July 1, 1879.—Circular relating to future execution of the pre-emption, homestead, and timber-culture laws.

July 3, 1879.—Circular relating to relief for parties found trespassing upon the public domain, by cutting and removing timber therefrom, &c.

July 11, 1879.—Notice of removal of the land office at Hays City to Wakeeney, Kans.

July 19, 1879.—Notice of removal from Sioux Falls to Mitchell, Dak.

July 23, 1879.—Circular relating to timber trespass cases, how to be reported, &c.

July 31, 1879.—Circular relating to forms for inquiries of pre-emptors regarding their claims.

September 1, 1879.—Circular instructions in regard to soldiers' additional homestead claims.

September 20, 1879.—Circular instructions additional in relation to homesteads within the limits of railroad or military wagon-road land grants.

September 24, 1879.—Circular relating to deputy mineral surveyors being precluded from acting either directly or indirectly as attorneys in mineral claims.

October 6, 1879.—Circular relating to original certificates of deposits for surveys of public lands.

October 7, 1879.—Circular relating to testimony offered by pre-emption and homestead claimants at the time of making final proof.

October 23, 1879.—Order to registers and receivers to transmit certificates of deposit to General Land Office for examination before accepting them in payment for lands.

October 30, 1879.—Order relating to prompt attendance by all employés of General Land Office; official hours, &c.
October 30, 1879.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior.
October 31, 1879.—Proclamation, &c., ordering sales at Huntsville, Ala., with usual notice, &c.
November 1, 1879.—Circular relating to subdividing sections of public lands; lost corners, &c.
November 7, 1879.—Circular instructions relating to the adjustment of railroad grants, embracing regulations in force at date of circular, with forms for verification of lists of selections, and also plats of survey of such roads.
November 8, 1870.—Proclamation, &c., ordering sales at Montgomery, Ala., with usual notice, &c.
December 22, 1879.—Proclamation, &c., at Natchitoches, La., with usual notice, &c.
January 17, 1880.—Circular relating to published notice of intention to make final proof in pre-emption and homestead cases.
January 20, 1880.—Circular relating to unsurveyed islands and beds of meandered lakes.
January 24, 1880.—Circular relating to assigned certificates of deposits receivable only in pre-emption, cash entries, and commuted homesteads.
January 26, 1880.—Circular relating to cancellation of entries.
February 20, 1880.—Notice of the establishment of a land office at Grand Forks, in Dakota.
March 3, 1880.—Circular respecting filing of township plats and acknowledging their receipt to surveyor general and to the General Land Office.
March 3, 1880.—Circular relating to claimants for mineral patents who are not residents of the district where the vein, lode, &c., is located.
March 5, 1880.—Circular of January 17, 1880, revoked, relating to applications of surveys under the deposit system—excess, repayment, assignments, &c.
March 8, 1880.—Notice of change of boundaries of land districts in Colorado.
March 10, 1880.—Circular relating to the requirements of the homestead, pre-emption, and timber-culture acts, &c.
March 16, 1880.—Circular relative to furnishing proper descriptions by legal subdivisions.
March 22, 1880.—Notice, withdrawing from sale or disposal certain described lands in the States of Minnesota and Wisconsin.
March 29, 1880.—Notice of removal of the land office at New Ulm to Tracy, in Minnesota.
April 15, 1880.—Circular relating to disposals of coal lands.
April 22, 1880.—Circular relating to withdrawal of mineral lands being revoked, &c.
May 25, 1880.—Circular relating to pre-emption, homestead, and timber-culture claimants filing written relinquishments of their claims under act of May 14, 1880; respecting relinquishments and contests; placing homesteaders on the same footing with pre-emptors on surveyed lands.
June 24, 1880.—Notice of the establishment of a land office at Yakima, in Washington Territory.
June 25, 1880.—Order relating to leaves of absence, &c.

June 29, 1880.—Circular relating to the felling and removing of timber on the public lands.
July 7, 1880.—Notice of the establishment of a land office at Miles City, in Montana.
July 16, 1880.—Circular relating to settlers' affidavits in pre-emption and commuted homestead entries.
July 17, 1880.—Circular relating to trespasses on the public domain, suits, &c.; where lands entered and paid for neither criminal nor civil suits shall be maintained for trespassing.
July 22, 1880.—Circular relating to certificates of deposit received in payment for lands sold.
July 28, 1880.—Circulars relating to receivers' accounts.
August 6, 1880.—Circular instructions governing the repayment of purchase money, fees, commissions, and excesses under sections 2362 and 2363, United States Revised Statutes.
September 3, 1880.—Circular instructions under the desert land act of March 3, 1877.
September 7, 1880.—Circular relating to returns and accounts under act of 15th of June, 1880.
September 23, 1880.—Circular relating to applications to enter or select as agricultural lands, under any act of Congress other than the pre-emption and homestead acts, lands returned as mineral by the surveyor-general, &c.
October 1, 1880.—General yearly circular, in pamphlet form, showing the manner of proceeding to obtaining title to public lands under existing laws.
October 6 to 13, 1880.—Pamphlet embracing record of the proceedings of a convention of United States surveyors-general held at Salt Lake City, Utah, pursuant to an order issued by the Commissioner of the General Land Office.
October 8, 1880.—Circular instructions prescribed under act of Congress approved June 16, 1880, relating to trespasses upon the public lands.
October 11, 1880.—Circular relative to detailed and condensed receivers' accounts current.
October 18, 1880.—Annual report of the Commissioner of the General Land Office to the Secretary of the Interior, showing operations under the laws relating to the public lands during the past fiscal year.
November 8, 1880.—Circular relating to advances to disbursing agents where they are in arrears.
November 27, 1880.—Circular relating to appeals from decisions of local officers.
December 10, 1880.—Circular relating to applications for patents for mining claims.
December 17, 1880.—Circular relating to hearings and testimony to be taken, &c.
December 20, 1880.—Pamphlet embracing rules of practice before the General Land Office, &c.
December 27, 1880.—Proclamation, &c., ordering public sales at Gainesville, in Florida, with usual notice, &c.
January 14, 1881.—Instructions to mail to certain pre-emptors certain forms of notice.
January 17, 1881.—Circular instructions relating to affidavits in mineral claims mentioned in section 2325 Revised Statutes, and expenditures, &c.

January 27, 1881.—Circular relating to fees and charges of the registers and receivers, &c.
January 28, 1881.—Circular relating to relief of certain settlers on restored railroad lands.
February 1, 1881.—Circular relating to fees on final certificates in donation claims.
February 2, 1881.—Circular relating to certificates of deposits received in payment for public lands to be marked canceled.
February 8, 1881.—Notice of postponement of sales ordered by proclamation, dated the 27th of December, 1880, to be held at Gainesville, Fla.
February 26, 1881.—Circular instructions relating to certificates of deposit, requiring them, before being accepted in payment for public lands, to be transmitted to the General Land Office for examination as to genuineness, &c.
February 26, 1881.—Pamphlet decision of the Commissioner of the General Land Office in the matter of the survey of the rancho El Solvante, in California.
March 1, 1881.—Notice of change of boundaries of land districts in Nebraska.
March 2, 1881.—Decision relating to private land claims in Missouri.
March 3, 1881.—Decision in the matter of the survey of the pueblo lands of San Francisco, Cal.
March 3, 1881.—Circular instructions relating to rules in regard to the survey of mining claims.

PENSION OFFICE.

Annual Report of the Commissioner. Pamphlet. 1849–1880.
*Bounty Land Laws and Office Regulations. Pamphlet. 1851–1880.
*Pension Laws and Office Regulations. Pamphlet. 1862–1880.
*Instructions to Examining Surgeons. Pamphlet. 1867–1880.
Roster of Examining Surgeons. 1867–1880.
Digest of Decisions of Secretary and Rulings of Commissioner. 1871.
Instructions to Special Agents. Pamphlet. 1876.

CENSUS OFFICE.

Seventh Census, 1850.

(1) The Seventh Census of the United States. Quarto. pp. 1022. (1853.)
(2) Statistical View of the United States. Octavo. pp. 400. (1854.)
(3) Mortality Statistics of the Seventh Census, &c. Octavo. pp. 304. (1855.)
(4) Digest of the Statistics of Manufactures. Octavo. pp. 143 (1859.) Published as Senate Ex. Doc. No. 39, Second Session Thirty-fifth Congress.)

Eighth Census, 1860.

(1) Preliminary Report of the Eighth Census. Octavo. pp. 274. (1862.)
(2) Population. Quarto. pp. 694. (1864.)
(3) Agriculture. Quarto. pp. 292. (1864.)
(4) Manufactures. Quarto. pp. 746. (1865.)
(5) Mortality and Miscellaneous Statistics. Quarto. pp. 584. (1866.)

*Printed from time to time.

Ninth Census, 1870.

(1) Statistics of Population. Tables I to VIII. Quarto. pp. 391. (1872.)
(2) Statistics of Agriculture. Quarto. pp. 366. (1872.)
(3) Statistics of Mortality. Quarto. pp. 423. (1872.)
(4) Population and Social Statistics. pp. 804 (including No. 1, mentioned above). (1872.)
(5) Industry and Wealth. Quarto. pp. 843 (including No. 2, mentioned above). (1872.)
(6) Vital Statistics. Quarto. 679 (including No. 3, mentioned above). (1872.)
(7) Compendium of the Ninth Census. Octavo. pp. 942. (1872.)

Tenth Census 1880.

Report of the Superintendent of Census, made to the Secretary of the Interior, 1879. Octavo. pp. 16. (1879.)
Plan of Inquiry into the History, and present condition of the Fisheries of the United States. Octavo. pp. 54. (1879.)
List of Charitable Institutions of the Roman Catholic Church in the United States. Quarto. pp. 10. (1879.)
Plan of Inquiry respecting Misfortune and Crime in the United States Quarto. pp. 20. (1880.)
List of Cotton Factories in the United States. Quarto. pp. 58. (1880.)
A Catalogue of the Forest Trees of North America. Octavo. pp. 94. (1880.)
List of Institutions of Beneficence, Charity, Reform, and Correction. Quarto. pp. 158. (1880.)
List of Glass Factories in the United States. Quarto. pp. 30. (1880.)
Instructions to Enumerators. Octavo. pp. 20. (1880.)
List of Woolen Factories in the United States. Quarto. pp. 102. (1880.)
Sketch of the History of Boston, Mass. Octavo. pp. 14. (1880.)
Report on the Enumeration of South Carolina on the Tenth Census. Octavo. pp. 16. (1880.)
Report of the Superintendent of Census made to the Secretary of the Interior. Octavo. pp. 6. (1880.)
Report on Population and Resources of Alaska (H. Ex. Doc. 40, Forty-sixth Congress, Third Session). Octavo. pp. 86. (1880.)
Preliminary List of the Fire, Fire-marine, and Marine Insurance Companies. Quarto. pp. 50. (1880.)

OFFICE OF INDIAN AFFAIRS.

Compilation of Indian Treaties. 1778 to 1837.
Annual Reports. 1849 to 1880 (inclusive).
Schoolcraft's History (Indian Tribes of the United States). 1851.
Laws, Regulations, &c., of Indian Bureau. Pamphlet. 1850.
Report to the President on the Cherokee Question. 1866.
Agreement between Cherokees and Delawares. Pamphlet. 1867.
Fort Phil. Kearney Massacre, and the future policy of the Government in the settlement of the Indian Question. Pamphlet. 1867.
Separate Indian Treaties. Pamphlet. 1854 to 1868.
Report of Commissioner to negotiate with Crow Indians. Pamphlet. 1873.

Report of Commissioner to negotiate with Shoshones. Pamphlet. 1873.
Report of Commissioner to negotiate with Utes. Pamphlet. 1873.
Report on Mission Indians in California. Pamphlet. 1873.
Half-breed Chippewa Scrip. (Correspondence thereon.) 1874.
Keport on Indians in Arizona, California, Nevada, and Utah. Pamphlet. 1874.
Report of Commissioner on Red Cloud and Whetstone Agencies. Pamphlet. 1874.
Report of Commissioner on Red Cloud Agency. Pamphlet. 1875.
Report on Commissioner on Black Hills relinquishment. Pamphlet. 1875.
Compilation of Revised Statutes, relative to Indian Affairs. Pamphlet. 1875.
Easy Reading Lessons for Indians. 1875.
Investigation Red Cloud Agency. 1875.
Report on Mission Indians in California. Pamphlet. 1876.
Ethnological Directions relative to Indian Tribes. Pamphlet. 1875.
Letter relative to Claim of North Carolina Cherokees. Pamphlet. 1875.
Pawnee Removal and Necessities. Pamphlet. 1875.
Report on Missouri Indians in California. Pamphlet. 1876.
Report on Red Cloud and Spotted Tail Agencies. Pamphlet. 1876.
Mineral Wealth, Climate, Rainfall and Natural Resources of Black Hills. Pamphlet. 1876.
List of Indian Reservations. Pamphlet. 1876.
Laws and Regulations relating to Trade with Indian Tribes. Pamphlet. 1876.
Instructions to Superintendents and Indian Agents. Pamphlet. 1876.
Report on Indian Agencies in Indian Territory. Pamphlet. 1877.
Supreme Court Decisions affecting Indians. Pamphlet.
Instructions to Superintendents and Indian Agents. Pamphlet. 1877.
Laws and Regulations relating to Trade with Indian Tribes. Pamphlet. 1879.
Instructions to Indian Agents. Pamphlet. 1880.

BUREAU OF EDUCATION.

Annual Reports.

Report 1867–'68.
Report 1870.
Report 1871.
Report 1872.
Report 1873.
Report 1874.
Report 1875.
Report 1876.
Report 1877.
Report 1878.
Report 1879.

Special Reports.

1869.—Special Report on the District of Columbia.
1869.—Scientific and Industrial Education.
1874.—Contributions to the Annals of Medical Progress and Medical Education in the United States, before and during the War of Independence.

1876.—Special Report on Public Libraries in the United States: Their History, Condition and Management. In 2 parts.
1877.—Contributions to the History of Medical Education and Medical Institutions in the United States of America. 1776–1876.

Circulars of Information.

August, 1870.—Illiteracy of 1860; School-room Diseases, &c.
July, 1871.—Report on the Systems of Public Instruction in Sweden and Norway.
November, 1871.—Methods of School Discipline.
December, 1871.—Compulsory Education.
January, 1872.—German and other foreign Universities.
February, 1872.—Reports on the Systems of Public Instruction in Greece, the Argentine Republic, Chili and Ecuador, with Statistics on Portugal and Japan, and an Official Report on Technical Education in Italy.
March, 1872.—An Inquiry concerning the Vital Statistics of College Graduates; distribution of College Students in 1870–'71; facts of Vital Statistics in the United States, with Tables and Diagrams.
April, 1872.—The Relation of Education to Labor.
June, 1872.—Education in the British West Indies.
July, 1872.—The Kindergarten.
November, 1872.—American Education at the International Exposition to be held at Vienna in 1873.
1873. No. 1.—Historical Summary and Reports on the Systems of Public Instruction in Spain, Bolivia, Uruguay and Portugal.
1873. No. 2.—Schools in British India.
1873. No. 3.—Account of College Commencements, for the Summer of 1873, in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey and Pennsylvania.
1873. No. 4.—Lists of Publications by members of certain College Faculties and Learned Societies in the United States.
1873. No. 5.—Account of College Commencements during 1873, in the Western and Southern States.
1874. No. 1.—Proceedings of the Department of Superintendence of the National Teachers' Association.
1874. No. 2.—Drawing in Public Schools; the present relation of Art to Education in the United States.
1874. No. 3.—History of Secondary Instruction in Germany.
1875. No. 1.—Proceedings of the National Educational Association, 1875.
1875. No. 2.—Education in Japan.
1875. No. 3.—Public Instruction in Belgium, Russia, Turkey, &c.
1875. No. 4.—Waste of Labor in the Work of Education.
1875. No. 5.—Educational Exhibit at the Centennial in 1876.
1875. No. 6.—Reformatory, Charitable, and Industrial Schools.
1875. No. 7.—Constitutional Provisions for Education in the several States.
1875. No. 8.—Schedule of Students' Work for the Centennial Exhibition.
1877. No. 1.—Education in China.
1877. No. 2.—Public Instruction in Finland, Netherlands, Denmark, &c.
1878. No. 1.—The Training of Teachers in Germany.
1878. No. 2.—Elementary Education in London.
1879. No. 1.—Training Schools for Nurses.

1879. No. 2.—Proceedings of the National Educational Association in 1879.
1879. No. 3.—Value of Common School Education to Common Labor.
1879. No. 4.—Training Schools of Cookery.
1879. No. 5.—American Education as described by the French Commission.
1880. No. 1.—College Libraries as Aids to Instruction.
1880. No. 2.—Proceedings of National Educational Association in 1880.
1880. No. 3.—Legal Rights of Children.
1880. No. 4.—Rural School Architecture.
1880. No. 5.—English Rural Schools.
1880. No. 6.—Chemistry and Physics.
1880. No. 7.—The Spelling Reform.
1881. No. 1.—Construction of Library Buildings.
1881. No. 2.—Technical Training in American Schools.
1881. No. 3.—Proceedings of National Educational Association in 1881.

Other Publications.

1872.—Free School Policy in connection with leading Western Railways.
1874.—A Statement of the Theory of Education in the United States of America, as approved by many leading Educators.
1875.—History of Bureau of Education.
1876.—Educational Conventions and Anniversaries during the Summer of 1876.
1877.—The International Conference on Education, held in Philadelphia, July 17 and 18, in connection with the International Exhibition of 1876.
1877.—A Manual of the Common Native Trees of the Northern United States.
1880.—The Brussels Congress.
1880.—The Indian School at Carlisle Barracks.
1880.—Industrial Education in Europe.
1880.—Vacation Colonies for Sickly School Children.
1880.—Progress of Western Education in China and Siam.
1880.—Medical Colleges in the United States.
1880.—Educational Tours in France.
1881.—Comparative Statistics of Elementary Education in Fifty Principal Counties.
1881.—Fifty Years of Freedom in Belgium; Education in Malta, &c.
1881.—Library Aids.
1881.—Recognized Medical Colleges in the United States.
1881.—The Discipline of the School.
1881.—Education and Crime.

UNITED STATES GEOLOGICAL AND GEOGRAPHICAL SURVEY OF THE TERRITORIES.

A.—Annual Reports.

(*First Annual Report.*)

First Annual Report of the United States Geological Survey of the Territories, embracing Nebraska. By F. V. Hayden, U. S. Geologist. Conducted under the authority of the Commissioner of the General

Land Office, 1867.] <Report of the Commissioner of General Land Office for the year 1867. Washington, 1867. pp. 128–181, where it appears in the form of a letter dated "Nebraska City, July 1, 1867," without any other heading.

(*Second Annual Report.*)

[Second Annual Report of the United States Geological Survey of the Territories, embracing Wyoming. By F. V. Hayden, U. S. Geologist. Conducted under the authority of the Commissioner of the General Land Office, 1868.] <Report of the Commissioner of General Land Office for the year 1868. Washington, 1868. pp. 220–255, where it appears in the form of letters dated "Fort Steele, Union Pacific Railroad, September 5, 1868," and "Fort Sanders, Wyoming Territory, September 25, 1868," under the heading "Report of F. V. Hayden on the Geography of the Missouri Valley."

(*Third Annual Report.*)

Preliminary Field Report of the United States Geological Survey of Colorado and New Mexico, conducted under the authority of Hon. J. D. Cox, Secretary of the Interior. By F. V. Hayden, United States Geologist. Washington: Government Printing Office. 1869. 8vo. pp. 155.

(*Reprint of I, II, and III.*)

First, Second, and Third Annual Reports of the United States Geological Survey of the Territories for the years 1867, 1868, and 1869, under the Department of the Interior. Washington: Government Printing Office. 1873. 8vo. 4 p. ll., pp. 7–261.

(*Fourth Annual Report.*)

Preliminary Report of the United States Geological Survey of Wyoming, and Portions of Contiguous Territories (being a second annual report of progress), conducted under the authority of the Secretary of the Interior, by F. V. Hayden, United States Geologist. Washington: Government Printing Office. 1871. 8vo. pp. 511.

NOTE.—Though called in the title a "*second*" Annual Report, this becomes really the *fourth* Annual Report, in virtue of considering the informal Reports for 1867 and 1868 as respectively the *first* and *second* of this series; and successive Reports are enumerated accordingly, that for 1871 becoming the *fifth*.

(*Fifth Annual Report.*)

Preliminary Report of the United States Geological Survey of Montana and portions of Adjacent Territories; being a fifth annual report of progress. By F. V. Hayden, United States Geologist. Conducted under authority of the Secretary of the Interior. Washington: Government Printing Office. 1872. 8vo. pp. i–vi, 3–538 (with 64 figg.), 1 l., 2 pll., 5 maps folded.

Supplement of the Fifth Annual Report of the United States Geological Survey of the Territories for 1871. F. V. Hayden, United States Geologist in charge. Report on Fossil Flora. By Leo Lesquereux. Conducted under authority of the Secretary of the Interior. Washington: Government Printing Office. 1872. 8vo. pp. 22.

NOTE.—The third, fourth, and fifth Annual Reports are named in their titles "preliminary," in distinction from the "final" or quarto Reports of the Survey, each one being, in fact, the complete Report of progress for the year to which it relates. The term "preliminary" is dropped with the sixth and succeeding Reports.

(*Sixth Annual Report.*)

Sixth Annual Report of the United States Geological Survey of the Territories, embracing Portions of Montana, Idaho, Wyoming, and Utah; being a Report of Progress of the Explorations for the year 1872. By F. V. Hayden, United States Geologist. Conducted under the authority of the Secretary of the Interior. Washington: Government Printing Office. 1873. 8vo. pp. i–xi, 1–844 (with 68 figg. and 3 diagrams), 12 pll., 5 maps.

(*Seventh Annual Report.*)

Annual Report of the United States Geological and Geographical Survey of the Territories, embracing Colorado; being a Report of Progress of the Exploration for the year 1873. By F. V. Hayden, United States Geologist. Conducted under the authority of the Secretary of the Interior. Washington: Government Printing Office. 1874. 8vo. pp. i–xii, 1–718 (with 110 illustrations, including woodcuts, plates, and maps).

(*Eighth Annual Report.*)

Annual Report of the United States Geological and Geographical Survey of the Territories, embracing Colorado and parts of Adjacent Territories; being a Report of Progress of the Exploration for the year 1874. By F. V. Hayden, United States Geologist. Conducted under the authority of the Secretary of the Interior. Washington: Government Printing Office. 1876. 8vo. pp. i–ix, 1–515 (with 88 illustrations,—woodcuts, plates, and maps), and several unpaged leaves.

(*Ninth Annual Report.*)

Ninth Annual Report of the United States Geological and Geographical Survey of the Territories, embracing Colorado and parts of adjacent Territories; being a Report of Progress of the Exploration for the year 1875. By F. V. Hayden, United States Geologist. Conducted under the authority of the Secretary of the Interior. Washington: Government Printing Office. 1877. 8vo. pp. i–vii, 1–827, 10 unpaged ll, pll. i–lxx, 7 maps, 67 woodcuts.

(*Tenth Annual Report.*)

Tenth Annual Report of the United States Geological and Geographical Survey of the Territories, embracing Colorado and parts of adjacent Territories; being a Report of Progress of the Exploration for the year 1876. By F. V. Hayden, United States Geologist. Conducted under the authority of the Secretary of the Interior. Washington: Government Printing Office. 1878. 8vo. pp. i–xxix, 1–546, pll. i–lxxix, woodcuts, 1–9.

(*Preliminary to the Eleventh Annual Report.*)

Department of the Interior. Preliminary Report of the Field Work of the United States Geological and Geographical Survey of the Territories for the Season of 1877. Washington: Government Printing Office. 1877. 8vo. pp. 35.

NOTE.—The above is the title and collation of the separate pamphlet copies, repaged and furnished with title-page, of this Preliminary Report, which otherwise forms part of the Annual Report of the Secretary of the Interior for 1877 (pp. 755–787).

(*Eleventh Annual Report.*)

Eleventh Annual Report of the United States Geological and Geographical Survey of the Territories, embracing Idaho and Wyoming; being a Report of Progress of the Exploration for the year 1877. By F. V. Hayden, United States Geologist. Conducted under the authority of the Secretary of the Interior. Washington: Government Printing Office. 1879. pp. i–xxviii, 1–720. 8vo.

(*Preliminary to the Twelfth Annual Report.*)

Department of the Interior. United States Geological and Geographical Survey. F. V. Hayden, United States Geologist-in-charge. Preliminary Report of the United States Geological and Geographical Survey of the Territories for the Season of 1878. By F. V. Hayden. Washington: Government Printing Office. 1878. 8vo. pp. 29.

NOTE.—The above is the title and collation of the separate pamphlet copies, repaged and furnished with title-page, of this Preliminary Report, which otherwise forms part of the Annual Report of the Secretary of the Interior for 1878 (pp. 951–977).

The regular Twelfth Annual Report of the Survey for 1878 is in preparation.

B.—BULLETINS

Volume I.—1874–1876.

Department of the Interior. Bulletin of the United States Geological and Geographical Survey of the Territories. F. V. Hayden, United States Geologist in charge. 1874 and 1875. Vol. I. Washington: Government Printing Office. 1875. 8vo. pp. xiii + 28 + 77 + 499 + 19 ll. unpaged, 26 pll., 3 maps, 1 woodcut.

Volume II.—1876.

Department of the Interior. Bulletin of the United States Geological and Geographical Survey of the Territories. F. V. Hayden, U. S. Geologist in charge. 1876. Volume II. Washington: Government Printing Office. 1876. 8vo. pp. i–xii, 1–292 + 8ll. unpaged, pll. 1–49 (pll. 32–41=folded pll. i–x) + pll. i–vi, 2 folded maps, 2 woodcuts in text.

Volume III.—1877.

Department of the Interior. Bulletin of the United States Geological and Geographical Survey of the Territories. F. V. Hayden, U. S. Geologist in charge. 1877. Volume III. Washington: Government Printing Office. 1877. 8vo. pp. i–ix, 1–856, pll. i–xxxix, 19 woodcuts

Volume IV.—1878.

Department of the Interior. Bulletin of the United States Geological and Geographical Survey of the Territories. F. V. Hayden, U. S. Geologist in charge. 1878. Volume IV. Washington: Government Printing Office. 1878. 8vo. pp. i–viii, 1–908, 4 unpaged ll., 1 pl., 16 woodcuts.

Volume V.—1879-'80.

Department of the Interior. Bulletin of the United States Geological and Geographical Survey of the Territories. F. V. Hayden, U. S. Geologist in charge. 1879-'80. Volume V. Washington: Government Printing Office. 1880. pp. i-vii, 1-1072, 8°. Woodcuts.

Volume VI.

Department of the Interior. United States Geological and Geographical Survey. F. V. Hayden, U. S. Geologist in charge. Bulletin of the United States Geological and Geographical Survey of the Territories. Volume VI. [Nos. 1 and 2.] Washington: Government Printing Office. pp. 1 [397]. 8°.

Nos. 1 and 2 only of this volume yet issued.

C.—Miscellaneous Publications.

Note.—There are twelve Miscellaneous Publications, independent of each other, but numbered in regular series, 1 to 12. Misc. Pub. No. 1, which is virtually the 2d edition of one of the "Unclassified Publications," having passed to a 3d edition, and Misc. Pub. No. 5 to a 2d edition, there are in all fourteen issues of this class.

Department of the Interior. U. S. Geological and Geographical Survey of the Territories. F. V. Hayden, U. S. Geologist-in-charge. [*Mut. mut.*]

Miscellaneous Publication No. 1.

Miscellaneous Publications, No. 1. List of Elevations in that portion of the United States west of the Mississippi River. Collated and arranged by Henry Gannett, Assistant. Washington: Government Printing Office. 1873. 8vo. pp. 47.

Note.—This is virtually a *second edition*, much modified, of an "Unclassified Publication," having the following title and collation: Lists of Elevations and Distances in that portion of the United States west of the Mississippi River. Collated and arranged by Prof. C. Thomas, Asst. U. S. Geol. Surv., under Dr. F. V. Hayden. Washington: Government Printing Office. 1872. [12*mo*, *pp.* 31.] That being then the original edition, Mr. Gannett's revision of the subject in 1873 is considered a *second* edition (though not so named in the title), and his revision of 1875 is the *third* edition, and is so entitled. See title next below, and see beyond, under head of "Unclassified Publications," p. 41.

Miscellaneous Publication No. 1.—*Third Edition.*

Miscellaneous Publications, No. 1. Lists of Elevations principally in that portion of the United States west of the Mississippi River. Third Edition. Collated and arranged by Henry Gannett, M. E. Washington: Government Printing Office. 1875. 8vo. pp. 72, i, ii.

Miscellaneous Publication No. 2.

Miscellaneous Publications, No. 2. Meteorological Observations, during the year 1872, in Utah, Idaho, and Montana. Prepared for publication by Henry Gannett, Assistant. Washington: Government Printing Office. 1873. 8vo. pp. 120.

Miscellaneous Publication No. 3.

Miscellaneous Publications, No. 3. Birds of the Northwest: A Hand Book of the Ornithology of the Region drained by the Missouri River

and its Tributaries. By Elliott Coues, Captain and Assistant Surgeon U. S. Army. Washington: Government Printing Office. 1874. 8vo. pp. i–xi, 1–791.

Miscellaneous Publication No. 4.

Miscellaneous Publications, No. 4. Synopsis of the Flora of Colorado. By Thomas C. Porter and John M. Coulter. Washington: Government Printing Office. March 20, 1874. 8vo. p. ll. 5, pp. 180.

Miscellaneous Publication No. 5.

Miscellaneous Publications, No. 5. Descriptive Catalogue of the Photographs of the United States Geological Survey of the Territories for the years 1869 to 1873, inclusive. W. H. Jackson, Photographer. Washington: Government Printing Office. 1874. 8vo. pp. 83.

Miscellaneous Publication No. 5.—Second Edition.

Miscellaneous Publications, No. 5. Descriptive Catalogue of the Photographs of the United States Geological Survey of the Territories, for the years 1869 to 1875, inclusive. Second Edition. W. H. Jackson, Photographer. Washington: Government Printing Office. 1875. 8vo. pp. 81, 14 illustrations.

Miscellaneous Publication No. 6.

Miscellaneous Publications, No. 6. Meteorological Observations made during the year 1873 and the early part of the year 1874 in Colorado and Montana Territories. Prepared for publication by George B. Chittenden. Washington: Government Printing Office. 1874. 8vo. pp. 57.

Miscellaneous Publication No. 7.

Miscellaneous Publications, No. 7. Ethnography and Philology of the Hidatsa Indians. By Washington Matthews, Assistant Surgeon United States Army. Washington: Government Printing Office. 1877. 8vo. pp. i–vi, 1–239.

Miscellaneous Publication No. 8.

Miscellaneous Publications, No. 8. Fur-Bearing Animals: A Monograph of North America Mustelidæ, in which an Account of the Wolverene, the Martens or Sables, the Ermine, the Mink and various other kinds of Weasels, several species of Skunks, the Badger, the Land and Sea Otters, and numerous Exotic Allies of these Animals, is contributed to the History of North American Mammals. By Elliott Coues, Captain and Assistant Surgeon United States Army, Secretary and Naturalist of the Survey. Illustrated with sixty figures on twenty plates. Washington: Government Printing Office. 1877. 8vo. pp. i–xiv, 1–348, pll. i–xx.

Miscellaneous Publication No. 9.

Miscellaneous Publications, No. 9. Descriptive Catalogue of Photographs of North American Indians. By W. H. Jackson, Photogra-

pher of the Survey. Washington: Government Printing Office. 1877. 8vo. pp. i–vi, 1–124.

Miscellaneous Publication No. 10.

Miscellaneous Publications, No. 10. Bibliography of North American Invertebrate Paleontology, being a Report upon the Publications that have hitherto been made upon the Invertebrate Paleontology of North America, including the West Indies and Greenland. By C. A. White, M. D., Paleontologist of the United States Geological Survey, and H. Alleyne Nicholson, M. D., D. Sc., Professor at the University of St. Andrews, Scotland. Washington: Government Printing Office. 1878. 8vo. pp. 132.

Miscellaneous Publication No. 11.

Miscellaneous Publications, No. 11. Birds of the Colorado Valley. A Repository of Scientific and Popular Information concerning North American Ornithology. By Elliott Coues. *Ἦλθ', ἦλθε χελιδὼν καλὰς ὥρας ἄγουσα.* Part First, Passeres to Laniidæ. Bibliographical Appendix. Seventy Illustrations. Washington: Government Printing Office. 1878. 8vo. pp. i–xvi, 1–807, figg. 70.

Miscellaneous Publication No. 12.

Miscellaneous Publications, No. 12. History of North American Pinnipeds. A Monograph of the Walruses, Sea-Lions, Sea-Bears and Seals of North America. By Joel Asaph Allen, Assistant in the Museum of Comparative Zoölogy at Cambridge, Special Collaborator of the Survey. Washington: Government Printing Office. 1880. pp. i–xvi, 1–785. 8°.

D.—Final Reports, or Monographs.

Note (1).—Vols. III, IV, VIII have not yet appeared. Nine volumes have been published of this *quarto* series; those required to fill the breaks in the series, and also Vol. XIII, are in press or in preparation. The sequence of the volumes is not that of their respective dates.

Note (2).—Each volume of this quarto series has *two* title pages: *one*, the general title of the volume as forming one of the series: *the other*, the special title of the Monograph of which the volume consists. In the first three cases coming below (Vols I, II, and V), the general and special titles are both given, since the former are not uniform; in the remaining cases the uniform general title is once cited, after which only the special titles are given.

Volume I.—Fossil Vertebrates.—1873.

Department of the Interior. Report of the United States Geological Survey of the Territories. F. V. Hayden, United States Geologist in charge. In five volumes.[*] Washington: Government Printing Office, 1873.

Part I. Contributions to the Extinct Vertebrate Fauna of the Western Territories. By Joseph Leidy, 1873. 4to. pp. 358, pll. 37, with 37 ll. Explanatory.

Note.—There is no Part II.

Volume II.—Cretaceous Vertebrata.—1875.

Department of the Interior. Report of the United States Geological Survey of the Territories. F. V. Hayden, United States Geologist in charge. Vol. II. Washington: Government Printing Office. 1875.

United States Geological Survey of the Territories. The Vertebrata of the Cretaceous Formations of the West. By E. D. Cope. Washington: Government Printing Office. 1875. 4to. pp. i–iv, 1 l., pp. 1–302,1 l., with pll. lvii and 57 ll. explanatory, 10 woodcuts.

Volume V.—North America Acrididæ.—1873.

Department of the Interior. Report of the United States Geological survey of the Territories. F. V. Hayden, United States Geologist in charge. In five volumes [*]. Washington: Government Printing Office. 1873.

Part I. Synopsis of the Acrididæ of North America. By Cyrus Thomas, Ph. D. 1873. 4to. pp. x, 262, with 1 pl. and 2 woodcuts.

NOTE.—There is no Part II.

Department of the Interior. Report of the United States Geological Survey of the Territories. F. V. Hayden, United States Geologist in charge. Volume [*mut. mut.*] Washington: Government Printing Office. [*An. mut. mut.*]

NOTE.—The above is the general title which covers, *mut. mut.*, all the following volumes.

Volume VI.—Cretaceous Flora.—1874.

United States Geological Survey of the Territories. Contributions to the Fossil Flora of the Western Territories. Part I. The Cretaceous Flora. By Leo Lesquereux. Washington: Government Printing Office. 1874. 4to. P. ll. 4, pp. 1–136, pll. 30, with 30 ll. explanatory.

NOTE.—Part II is the Tertiary Flora, forming Vol. VII.

Volume VII.—Tertiary Flora.—1878.

United States Geological Survey of the Territories. Contributions to the Fossil Flora of the Western Territories. Part II. The Tertiary Flora. By Leo Lesquereux. Washington: Government Printing Office. 1878. 4to. pp. i–xv, 1 l., 1–366, pll. i–lxv, with 65 ll. explanatory.

NOTE.—Part I is the Cretaceous Flora, forming Vol. VI.

Volume IX.—Fossil Invertebrates.—1876.

United States Geological Survey of the Territories. A Report on the Invertebrate Cretaceous and Tertiary Fossils of the Upper Missouri Country. By F. B. Meek. Washington: Government Printing Office. 1876. 4to. pp. i–lxiv, 1–629, with 85 woodcuts, and pll. 45, with 45 ll. explanatory.

Volume X.—Geometrid Moths.—1876.

United States Geological Survey of the Territories. A Monograph of the Geometrid Moths or Phalænidæ of the United States. By A. S. Packard, Jr., M. D. Washington: Government Printing Office. 1876. 4to. pp. i–iv, 2 ll., pp. 1–607, pll. 13, with 13 ll. explanatory.

Volume XI.—North American Rodentia.—1877.

United States Geological Survey of the Territories. Monographs of North American Rodentia. By Elliott Coues, Captain and Assistant

Surgeon United States Army, Secretary and Naturalist of the Survey; and Joel Asaph Allen, Assistant in the Museum of Comparative Zoology, Cambridge, Special Collaborator of the Survey. Washington: Government Printing Office. 1877. 4to. pp. i*–xii*, i–x, 1–265, 265 bis, 266–1091, pll. i–vi, 3 woodcuts.

NOTE.—Oversheets of Appendix B, retitled but not repaged, were separately issued in an edition of 200 copies, as follows: Material for a Bibliography of North American Mammals, prepared by Theodore Gill and Elliott Coues, Extracted from the Eleventh Volume of the Final Reports of the Survey, being Appendix B of the Monographs of North American Rodentia. By Elliott Coues and Joel Asaph Allen. Washington: Government Printing Office. 1877. 4to. Paper title-l. and pp. 951–1082.

Volume XII.—Fresh-water Rhizopods.

United States Geological Survey of the Territories. Fresh-water Rhizopods of North America. By Joseph Leidy, M. D., Professor of Anatomy in the University of Pennsylvania, and of Natural History in Swarthmore College, Pennsylvania. Washington: Government Printing Office. 1879. pp. i–xi, 1–324, 4to. Plates.

E.—UNCLASSIFIED PUBLICATIONS.

NOTE.—The publications grouped under this head (as they fall under no other) have no serial connection, and are simply enumerated in chronological order. They include the publications of the United States Entomological Commission.

[*First Unclassified Publication.*]

Forty-Second Congress, First Session. House of Representatives. Ex. Doc., No. 19. Final Report of the United States Geological Survey of Nebraska, and portions of the adjacent Territories, made under the direction of the Commissioner of the General Land Office. By F. V. Hayden, United States Geologist. March 23, 1871. Ordered to be printed. Washington: Government Printing Office. 1871. 8vo. pp. 264, pll. 11, with 11 ll. explanatory, 1 map folded.

[*Second Unclassified Publication.*]

List of Elevations and Distances in that portion of the United States west of the Mississippi River. [First Edition.] Collated and arranged by Prof. C. Thomas, Assistant United States Geological Survey, under Dr. F. V. Hayden. Washington: Govrenment Printing Office. 1872. 12mo. pp. 31.

NOTE.—See note, anteà, p. 33, sub Misc. Pub. No. 1. Subsequent editions (2d and 3d) of this publication became "Misc. Pub. No. 1," and "Misc. Pub. No. 1.—Third Edition."

[*Third Unclassified Publication.*]

Profiles, Sections, and other Illustrations, designed to accompany the Final Report of the Chief Geologist of the Survey, and sketched under his directions. By Henry W. Elliott. Under authority of the Secretary of the Interior. New York: Julius Bien. 1872. 4to. 2 p. ll., 65 pll., mostly folded.

NOTE.—This volume was originally intended to illustrate one of the vols. (Vol. IV) of the quarto series of "Reports of the United States Geological Survey of the Territories"; but it was never thus used, and Vol. IV of the 4to Reports is to be a different work. (See p. 51.) Only 100 copies were published, and the work is now out of print.

[*Fourth Unclassified Publication.*]

Department of the Interior. United States Geological Survey of the Territories. F. V. Hayden, United States Geologist in charge. Synopsis of New Vertebrata for the Tertiary of Colorado, obtained during the summer of 1873. By Professor E. D. Cope. [Extracted from the Seventh Annual Report of the United States Geological Survey of the Territories, F. V. Hayden, United States Geologist in charge.] Washington: Government Printing Office. October, 1873. 8vo. pp. 19.

NOTE.—Only quasi-extracted from the Report of which it ostensibly forms part. It was published in advance of the Seventh Annual Report, as a separate pamphlet; and finally appeared in that Report so much modified as to be in effect a different article.

[*Fifth Unclassified Publication.*]

Catalogue of the Publications of the United States Geological Survey of the Territories. F. V. Hayden, Geologist in charge. Washington: Government Printing Office. 1874. 8vo. pp. 20.

NOTE.—This is the original edition of the present Catalogue. But there was a still earlier "List of the Publications of the Geological Survey of the Territories," in Bulletin No. 1, 1st series, 1874, pp. 5–7.

[*Sixth Unclassified Publication.*]

Catalogue of the Photographs of the U. S. Geological and Geographical Survey of the Territories. By W. H. Jackson, Photographer. Washington: Government Printing Office. 1875. 18mo. pp. 51.

NOTE.—This is a *fifth* catalogue of photographs. The first *three* were informal publications, of which no account has been taken. The *fourth* is Misc. Pub. No. 5. The *sixth* is Misc. Pub. No. 5, "second edition."

[*Seventh Unclassified Publication.*]

Department of the Interior, U. S. Geological and Geographical Survey of the Territories. F. V. Hayden, U. S. Geologist in charge. The Grotto Geyser of the Yellowstone National Park. With a descriptive note and map, and an illustration by the Albert-type process. [n. d. n. p. Washington: Government Printing Office. 1876.] Oblong folio, 1 p. l., 2 ll. of text, 1 Albert-type, 1 map.

NOTE.—The edition consists of 210 copies.

[*Eighth Unclassified Publication.*]*

Catalogue of the Publications of the United States Geological Survey of the Territories. F. V. Hayden, Geologist in charge. Second Edition. (Revised to December 31, 1876.) Washington: Government Printing Office. 1877. 8vo. pp. 38.

[*Ninth Unclassified Publication.*]*

Department of the Interior. U. S. Geological and Geographical Survey of the Territories. F. V. Hayden in charge. Bulletin of the United States Entomological Commission. Destruction of the Young or Unfledged Locusts. No. 1. Washington: Government Printing Office. 1877. 8vo. pp. 12.

[*Tenth Unclassified Publication.*]*

Department of the Interior. U. S. Geological and Geographical Survey of the Territories. F. V. Hayden, U. S. Geologist in charge. Bulletin of the United States Entomological Commission. On the Natural History of the Rocky Mountain Locust, and on the Habits of the Young or Unfledged Insects, as they occur in the more fertile country in which they will hatch the present year. No. 2. Washington: Government Printing Office. May, 1877. 8vo. pp. 15, including 11 cuts and one map.

[*Eleventh Unclassified Publication.*]*

Department of the Interior. U. S. Geological and Geographical Survey of the Territories. F. V. Hayden in charge. Bulletin of the United States Entomological Commission. Destruction of the Young or Unfledged Locusts. No. 1. Second Edition. Washington: Government Printing Office. June, 1877. 8 vo. pp. 15.

NOTE.—Somewhat modified from the first edition.

[*Twelfth Unclassified Publication.*]*

Department of the Interior. U. S. Geological and Geographical Survey of the Territories. F. V. Hayden U. S. Geologist in charge. Bulletin of the United States Entomological Commission. On the Natural History of the Rocky Mountain Locust, and on the Habits of the Young or Unfledged Insects, as they occur in the more fertile country in which they will hatch the present year. No. 2. Second Edition. Washington: Government Printing Office. June, 1877. 8 vo. pp. 14, including 11 cuts and 1 map.

NOTE.—Somewhat modified from the first edition.

[*Thirteenth Unclassified Publication.*]*

Department of the Interior. United States Geological Survey. F. V. Hayden, U. S. Geologist-in-charge. First Annual Report of the United States Entomological Commission for the year 1877 relating to the Rocky Mountain Locust and the best methods of preventing its Injuries and of guarding against its Invasions, in pursuance of an appropriation made by Congress for this purpose. With maps and illustrations. Washington: Government Printing Office. 1878. 8vo. pp. i–xvi, 1–477, [1]–[295], pll. i–v, with 5 ll. explanatory, 3 maps, 111 woodcuts.

[*Fourteenth Unclassified Publication.*]

Department of the Interior. U. S. Geological and Geographical Survey of the Territories. F. V. Hayden, U. S. Geologist in charge. Illustrations of Cretaceous and Tertiary Plants of the Western Territories of the United States. Washington: Government Printing Office. 1878. 4to. 28 unpaged ll. (title, prefatory note, and 26 explanatory ll.), pll. i–xxvi.

NOTE.—The work consists of 26 plates, without text other than as above indicated. The edition is of 500 copies.

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* Repeated in list of publications of the U. S. Entomological Commission.

* Repeated in list of publications of U. S. Entomological Commission.

[*Fifteenth Unclassified Publication.*]

Department of the Interior. Catalogue of the Publications of the U. S. Geological and Geographical Survey of the Territories. F. V. Hayden. United States Geologist. Third Edition. Revised to December 31, 1878. Washington: Government Printing Office. 1879. 8vo. pp. 54,

[*Sixteenth Unclassified Publication.*]*

Department of the Interior. Second Report of the United States Entomological Commission for the years 1878 and 1879, relating to the Rocky Mountain Locust, and the Western Cricket, and treating of the best means of subduing the locust in its permanent breeding grounds, with a view of preventing its migrations into the more fertile portions of the trans-Mississippi country, in pursuance of appropriations made by Congress for this purpose. With maps and illustrations. Washington: Government Printing Office. 1880. pp. i–xviii, 1–322, 1–80, 8°. Maps.

U. S. GEOGRAPHICAL AND GEOLOGICAL SURVEY OF THE ROCKY MOUNTAIN REGION.

Report of Explorations in 1873, of the Colorado of the West and its tributaries, by Professor J. W. Powell, under the direction of the Smithsonian Institution. Washington: Government Printing Office. 1874. pp. 1–36. 8°.

Exploration of the Colorado River of the West and its tributaries. Explored in 1869, 1870, 1871, and 1872, under the direction of the Secretary of the Smithsonian Institution. Washington: Government Printing Office. 1875. 2p. ll., pp. i–xi, 1–291. 4°.

Department of the Interior. U. S. Geological and Geographical Survey of the Territories. Second Division. J. W. Powell, Geologist in charge. Report on the Geology of the Eastern Portion of the Uinta Mountains and a region of country adjacent thereto. With atlas. By J. W. Powell. Washington: Government Printing Office. 1876. pp. i–vii and 1–218. 4°. Atlas folio.

Department of the Interior. U. S. Geographical and Geological Survey of the Rocky Mountain Region. J. W. Powell, Geologist in charge. Contributions to North American Ethnology. Volume I. [Seal of Department of the Interior.] Washington: Government Printing Office. 1877.

Second title, p. xi: Department of the Interior. U. S. Geographical and Geological Survey of the Rocky Mountain Region. J. W. Powell, Geologist in charge. Tribes of the Extreme Northwest. By W. H. Dall. Tribes of Western Washington and Northwestern Oregon. By Geo. Gibbs. [Seal.] Washington: Government Printing Office. 1877. pp. i–xiv, 1–361. 4°. Map.

Department of the Interior. U. S. Geographical and Geological Survey of the Rocky Mountain Region. J. W. Powell in charge. Contributions to North American Ethnology. Volume III. [Seal.] Washington: Government Printing Office. 1877.

Second title, p. 1: Department of the Interior. U. S. Geographical and Geological Survey of the Rocky Mountain Region. J. W. Powell in charge. Tribes of California. By Stephen Powers. [Seal.] Washington: Government Printing Office. 1877. Title, pp. 1–3, 1–635. 4°.

Department of the Interior. U. S. Geographical and Geological Survey of the Rocky Mountain Region. J. W. Powell in charge. Report on the Geology of the Henry Mountains. By G. K. Gilbert. [Seal.] Washington: Government Printing Office. 1877. pp. i–x, 1–160. 4°. Plates.

U. S. Geographical and Geological Survey of the Rocky Mountain Region. J. W. Powell in charge. Preliminary Report on the Paleontology of the Black Hills, by R. P. Whitfield, containing descriptions of new species of fossils from the Potsdam, Jurassic, and Cretaceous formations of the Black Hills of Dakota. Washington: Government Printing Office. July, 1877. pp. 1–49. 8°.

Report on the Geographical and Geological Survey of the Rocky Mountain Region. By J. W. Powell. Washington: Government Printing Office. 1877. pp. 1–19. 8°.

Introduction to the Study of Indian Languages, with words, phrases, and sentences to be collected. By J. W. Powell. [Seal.] Washington: Government Printing Office. 1877. pp. 1–104, and 10 blank leaves. 4°.

Report on the Methods of Surveying the Public Domain, to the Secretary of the Interior, at the request of the National Academy of Sciences. By J. W. Powell. 1878. Washington: Government Printing Office. 1878. pp. 1–16. 8°.

Forty-fifth Congress, Second Session, House of Representatives. Ex. Doc. No. 73. Report on the Lands of the Arid Region of the United States, with a more detailed account of the lands of Utah. With maps. By J. W. Powell. April 3, 1878.—Referred to the Committee on Appropriations and ordered to be printed. Washington: Government Printing Office. 1878. pp. i–xiii, 1–195. 4°. Charts.

Report on the Lands of the Arid Region of the United States, with a more detailed account of the lands of Utah. With Maps. By J. W. Powell. Second Edition. Washington: Government Printing Office. 1879. pp. i–xv, 1–195. Charts.

Department of the Interior. U. S. Geographical and Geological Survey of the Rocky Mountain Region. J. W. Powell in charge. Report on the Geology of the Henry Mountains. By G. K. Gilbert. Second Edition. [Seal.] Washington: Government Printing Office. 1880. pp. i–x, 1–160. 4°. Plates.

Department of the Interior. U. S. Geographical and Geological Surof the Rocky Mountain Region. J. W. Powell in charge. Report on the Geology of the High Plateaus of Utah. With atlas. By C. E. Dutton, Captain of Ordnance, U. S. A. [Seal.] Washington: Government Printing Office. 1880. pp. i–xxxii, 1–307. 4°. Atlas folio.

Department of the Interior. U. S. Geographical and Geological Survey of the Rocky Mountain Region. J. W. Powell in charge. Report on the Geology and Resources of the Black Hills of Dakota. With atlas. By Henry Newton, E. M., and Walter P. Jenney, E. M. [Seal.] Washington: Government Printing. Office. 1880. pp. i–xviii, 1–566. 4°. Atlas folio.

Department of the Interior. U. S. Geographical and Geological Survey of the Rocky Mountain Region. J. W. Powell in charge. Contributions to North American Ethnology. Volume IV. [Washington: Government Printing Office. 1881.

Second title, p. iii: Department of the Interior. U. S. Geographical and Geological Survey of the Rocky Mountain Region. J. W. Powell in charge. Houses and House-Life of the American Aborigines.

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Circulars.

No. 1.—By Chas. V. Riley, A. S. Packard, jr., and Cyrus Thomas. 1877. [Request for data on the Natural History of the Rocky Mountain Locust.]

No. 2.—By Chas. V. Riley. 1877. [Data requested on Natural History and Modes of Destruction of *Caloptenus spretus*.]

No. 3.—By A. S. Packard. 1877. [Request for co-operation in the Investigation of the Rocky Mountain Locust.]

No. 4.—[Relative to *Caloptenus spretus*.]

No. 5.—By Chas. V. Riley. 1878. [Referring to the Prevention of Locust Invasions.]

No. 6.—By Chas. V. Riley. 1878. [Referring to the distribution of the First Report.]

No. 7.—By Chas. V. Riley. 1879. [Relating to the Cotton Worm.]

No. 8.—By A. S. Packard, jr. 1879. [Relating to the Hessian Fly.]

No. 9.—By Cyrus Thomas. 1879. [Relating to the Chinch Bug.]
No. 10.—By Chas. V. Riley. 1880. [Relating to the Cotton Worm.]
No. 11.—By Chas. V. Riley. 1880. [Instructions to agents of the United States Entomological Commission in the Cotton Worm Investigation.]
No. 12.—By A. S. Packard, jr. 1881. [Relating to the Bibliography of American Economic Entomology.]

Bulletins.

No. 1.—Destruction of the Young or Unfledged Locusts. 1877. pp. 15. Illustrated.—Second edition, 1877, being reprint of first edition.
No. 2.—On the Natural History of the Rocky Mountain Locust, and on the Habits of the Young or Unfledged Insects as they occur in the more fertile country in which they will hatch the present year. 1877. pp. 14. Illustrated.
No. 3.—The Cotton Worm: Summary of its Natural History, with an account of its Enemies, and the best means of controlling it; being a report of progress of the work of the Commission. By Chas. V. Riley, M. A., Ph. D. 1880. pp. 144. Illustrated.
No. 4.—The Hessian Fly, its Ravages, Habits, Enemies, and means of preventing its increase. By A. S. Packard, jr., M. D. 1880. pp. 43. Illustrated.
No. 5.—The Chinch-Bug, its History, Characters, and Habits, and the means of destroying it or counteracting its Injuries. By Cyrus Thomas, Ph. D. 1879. pp. 44. Illustrated.
No. 6.—General Index and Supplement to the nine Reports on the Insects of Missouri. By Charles V. Riley, M. A., Ph. D. 1881. pp. 177.

Reports.

First Annual Report of the United States Entomological Commission for the year 1877, relating to the Rocky Mountain Locust, and the best methods of preventing its Injuries and of guarding against its Invasions, in pursuance of an appropriation made by Congress for this purpose. With maps and illustrations. 1878. pp. 477 and [294], tabl. V.
Second Report of the United States Entomological Commission for the years 1878 and 1879, relating to the Rocky Mountain Locust and the Western Cricket, and treating of the best means of subduing the Locust in its permanent breeding ground, with a view of preventing its migration into the more fertile portions of the trans-Mississippi country, in pursuance of appropriations made by Congress for this purpose. With maps and illustrations. 1880. pp. 322 and [80], tabl. XVI.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 183.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

A report from the Secretary of State, and its accompanying papers, concerning the Smoke Abatement Exhibition which was held at South Kensington, London, last winter.

JUNE 16, 1882.—Ordered to lie on the table, and be printed.

To the Senate:

I transmit herewith a report from the Secretary of State, and its accompanying papers, concerning the Smoke Abatement Exhibition which was held at South Kensington, London, last winter.

CHESTER A. ARTHUR.

EXECUTIVE MANSION,
June 16, 1882.

To the President:

The Secretary of State has the honor to lay before the President, for communication to the Senate, copies of correspondence relating to the Smoke Abatement Exhibition which was held at South Kensington, London, last winter, together with a copy of the report in relation to that exhibition made to the American legation by the expert appointed by Mr. Lowell to attend it on behalf of the United States.

FRED'K T. FRELINGHUYSEN.

DEPARTMENT OF STATE,
June 14, 1882.

LIST OF ACCOMPANYING PAPERS.

No. 1.—Mr. Blaine to Mr. Lowell, March 22, 1881.
No. 2.—Mr. Drummond to Mr. Blaine, September 14, 1881.
No. 3.—Mr. West to Mr. Blaine, November 30, 1881.
No. 4.—Mr. Blaine to Mr. Lowell, December 1, 1881, telegram.
No. 5.—Mr. Blaine to Mr. West, December 6, 1881.
No. 6.—Mr. Lowell to Mr. Frelinghuysen, January 13, 1882.
No. 7.—Mr. Frelinghuysen to Mr. Lowell, February 24, 1882.
No. 8.—Mr. Lowell to Mr. Frelinghuysen, March 11, 1882.

No. 1.

Mr. Blaine to Mr. Lowell.

No. 132.] DEPARTMENT OF STATE,
Washington, March 22, 1881.

SIR: At the instance of the Hon. George H. Pendleton, I have to request you to procure such information as may be attainable concerning an exhibition said to have been arranged at South Kensington, London, for the purpose of testing scientifically the present appliances for the production of a more perfect combustion and the abatement of the smoke nuisance.

In view of the importance of this subject to Cincinnati, Pittsburgh, and other cities in this country engaged in manufacturing, in which large quantities of bituminous coal are consumed, I will thank you not only to report the result of the experiments at South Kensington, but also to make a very thorough and careful investigation of the whole subject, in order that the inhabitants of our manufacturing cities may have the benefit of any practical discoveries which may have been made for the abatement of the smoke nuisance.

I would, moreover, suggest the property of obtaining from the British Government, for distribution in this country, several sets of all the official reports on this subject which may have been printed.

I am, &c.,

JAMES G. BLAINE.

No. 2.

Mr. Drummond to Mr. Blaine.

LENOX, MASS., *September* 14, 1881. (Received September 15.)

SIR: With reference to my letter to you of the 24th ultimo, in which I informed you that it was proposed to hold in London an exhibition of apparatus of all kinds devised to prevent smoke or to consume smokeless fuel, as well as various kinds of fuel, I have now the honor to state that I have been instructed by Earl Granville to inform you that the committee have decided that the limit of time already fixed for the reception of applications of exhibitors is too short, and that therefore they will be fully prepared to consider favorably all applications from foreign exhibitors throughout the whole of September, and they will, so far as possible, reserve space for late exhibits, in order that none may be excluded.

I have, &c., VICTOR DRUMMOND.

No. 3.

Mr. West to Mr. Blaine.

WASHINGTON, *November* 30, 1881. (Received December 1.)

SIR: With reference to Mr. Drummond's note to you of the 14th September last, I have now the honor, in compliance with instructions received from Earl Granville, to inform you that the opening of the exhi-

bition of smoke-preventing apparatus was further postponed until about the 17th instant, on account of a considerable number of the exhibitors not having their work in a sufficiently forward state, and that the closing of the exhibition will not be earlier than the end of December. I am directed by his lordship to communicate this information to the United States Government, with a view to its being made public.

I have, &c.,

L. S. SACKVILLE WEST.

No. 4.

Mr. Blaine to Mr. Lowell.

[Telegram.]

WASHINGTON, *December* 1, 1881.

LOWELL, *Minister, London:*

Please select and send, in answer to invitation of British Government, some suitable person to report upon exhibition of smoke-preventing apparatus.

BLAINE.

No. 5.

Mr. Blaine to Mr. West.

DEPARTMENT OF STATE,
Washington, December 6, 1881.

SIR: Referring to previous correspondence in reference to the exhibition of smoke-preventing apparatus to be held at London, I have the honor to acknowledge the receipt of your note of the 30th ultimo, informing me of the further postponement of the opening of said exhibition until about the 17th of November just past.

In reply I beg to inform you that on the 1st instant, immediately upon the receipt of the intelligence contained in your note, I instructed Mr. Lowell, the American minister at London, by cable, to select and send a suitable person to attend the exhibition of smoke-preventing apparatus, and report upon it.

I have, &c., JAMES G. BLAINE.

No. 6.

Mr. Lowell to Mr. Frelinghuysen.

No. 289.] LEGATION OF THE UNITED STATES,
London, January 13, 1882. (Received January 27.)

SIR: Referring to instruction No. 132, of the 22d of March last, directing that a report should be made of the results of the exhibition proposed to be held at South Kensington of apparatus and appliances for the consumption of smoke, and Mr. Blaine's telegram, received at this legation on the 2d of December last, requesting me to select an expert

to make such report, I have the honor to acquaint you that, having consulted Mr. William Spottiswoode, the president of the Royal Society, on this subject, I have made an arrangement with Mr. John Hopkinson, a fellow of that society, who is represented as an entirely competent person to examine the machinery and appliances now upon exhibition at South Kensington for the production of a more perfect combustion of bituminous coal and the abatement of the smoke nuisance, and to make a report upon the whole matter. Mr. Hopkinson's terms will be ten guineas for each day that he is so employed, and he thinks he will require about a week for the proper performance of this duty.

I propose to draw my draft upon you in favor of Messrs. Morton, Rose & Co., for the payment of Mr. Hopkinson's compensation, and respectfully request that you will honor the same.

I have, &c.,

J. R. LOWELL.

No. 7.

Mr. Frelinghuysen to Mr. Lowell.

No. 321.] DEPARTMENT OF STATE,
Washington, February 24, 1882.

SIR: Acknowledging the receipt of your dispatch, No. 289, of the 13th ultimo, reporting the employment of Mr. John Hopkinson, F. R. S., to examine and report as to the Smoke Abatement Exhibition at South Kensington, I beg to request you to forward a separate account, supported by the receipt of Mr. Hopkinson, for the amount which you may pay him under the arrangement which you have made with him.

I am, &c.,

FRED'K T. FRELINGHUYSEN.

No. 8.

Mr. Lowell to Mr. Frelinghuysen.

No. 329.] LEGATION OF THE UNITED STATES,
London, March 11, 1882. (Received March 22.)

SIR: Referring to your No. 321, of the 24th ultimo, I have the honor to inclose herewith the report of John Hopkinson, esq., F. R. S., in relation to the Smoke Abatement Exhibition at South Kensington, and also his account for services, amounting to £59 10*s.*, properly receipted.

Agreeably to the information given in my No. 289, of the 13th of January last, I have drawn my draft upon you in favor of Messrs. Morton, Rose & Co. for the equivalent of the above amount ($289.56), and I have paid Mr. Hopkinson by my check on those gentlemen.

I also forward herewith my separate account of this transaction.

I have, &c.,

J. R. LOWELL.

[Inclosure 1 in No. 329.]

Mr. Hopkinson to Mr. Lowell.

4 WESTMINSTER CHAMBERS, VICTORIA STREET, S. W.,
February 27, 1882.

SIR: Herewith I beg to hand you my report on the International Exhibition of Smoke Preventing Appliances, also a prospectus of a similar exhibition to be held in

Manchester during the months of March and April, in the industrial section of which Mr. Coles informs me there will be some interesting exhibits which were not shown at South Kensington.

I have, &c., J. HOPKINSON.

[Inclosure 2 in 329.]

REPORT ON THE INTERNATIONAL EXHIBITION OF SMOKE-PREVENTING APPLIANCES.

The subject of the abatement of smoke, with the view of purifying the atmosphere of London and lessening the deleterious character of London fogs, was under consideration of two societies during the year 1880. In the spring of 1880 Mr. Ernest Hart brought the subject under the notice of the committee of the National Health Society. Being requested by this committee to take steps to bring the question into a practical form, he put himself in communication with Prof. Chandler Roberts, F. R. S., who undertook to examine scientifically existing appliances for the use of fuel, both in the arts and for domestic purposes. A considerable amount of information was collected. In July of 1881 Mr. Hart learned that the same subject had been under consideration of the Kyrle Society, and in conjunction with Miss Octavia Hill, the treasurer of that society, he arranged a proposal for the appointment of a joint committee of the two societies for the purpose of prosecuting the investigation and bringing the matter under the notice of the public. This committee was appointed. Its first step was to communicate with manufacturers and with public bodies, asking their co-operation in abating the smoke nuisance. They then obtained a report on the state of the law in regard to smoke. Public meetings were then held for the purpose of exciting an interest in the subject among people of influence, and it was decided that no better mode, both of collecting information and bringing the matter into public notice, than to hold an exhibition of appliances and inventions tending to the reduction of smoke could be adopted.

Smoke nuisance arising from manufacturing industries has been more than once dealt with by our legislature, with a considerable amount of success, but practically nothing has been done to compel people to reduce the smoke they send forth from their domestic fires. The problems of dealing with these two sources of smoke are very different, and consequently the subject-matter of the Smoke Abatement Exhibition naturally divides itself into appliances for domestic use and appliances for industrial use.

The importance of the whole subject can hardly be overrated. During the continued thick fogs two winters ago the death-rate of London increased to more than double the average for that time of the year.

The presence of smoke products in the air entirely alters the character of the fog. In the country the fog does not penetrate into the houses, because a rise of temperature of the air immediately converts the exceedingly minute drops of water which constitute mist into invisible aqueous vapor. This is not the case with a London fog. It penetrates into our houses, and the atmosphere of our rooms remains foggy, although its temperature may be considerably above the dew point. This effect is probably due to the minute drops of water being covered with a film of some form of hydrocarbon oil or tarry matter. It has also been shown by Mr. Aitken that the presence of products of combustion in the air tends to facilitate the precipitation of aqueous vapor when the temperature is near the dew point. The subject of abatement of smoke is inseparably involved in that of economizing fuel. If two tons of coal can be made to do the work of three, we shall, *ceteris paribus*, have but two-thirds of the smoke produced. Economy has also a direct effect in abating smoke, for an essential of economy is that the whole of the fuel shall be completely burned. If that be so, there can be no smoke. Whatever, then, is concerned with the economical use of fuel has been held to be within the limits of this exhibition.

Domestic use of fuel.—Fuel is used in our houses for two purposes, heating our rooms and cooking our food.

Heating of rooms.—In Germany and some other parts of the continent dwelling-rooms are generally heated by close stoves. Here the open fire is almost universal. The difference between the two systems is something more than a matter of taste. With a close stove the air of the room is heated by contact with the material of the stove, and the heat is distributed through the room by connection currents, the distribution by radiation being comparatively small. With the open grate the heat is distributed by radiation, and tends to heat the walls and furniture of the room without so greatly heating the air of the room. In this country the heating by stoves, or more generally by connection currents, is practically confined to entrance halls and public buildings, and it would probably be quite hopeless to attempt to force its introduction into dwelling-rooms. It is a very much easier problem to insure perfect and therefore smokeless combustion of fuel in a close stove than in an open grate. The problem of close stoves is to so regulate the admission of air that a minimum quantity

of gases shall be sent up the chimney consistent with perfect combustion, and that these gases shall be delivered at as low a temperature as possible. A great variety of close stoves, by various makers, is shown in the exhibition, but I doubt if it is useful for me to select any of these for description, as they present nothing very new in principle, and as it is very certain that the use of close stoves will not be the method adopted here to abolish smoke.

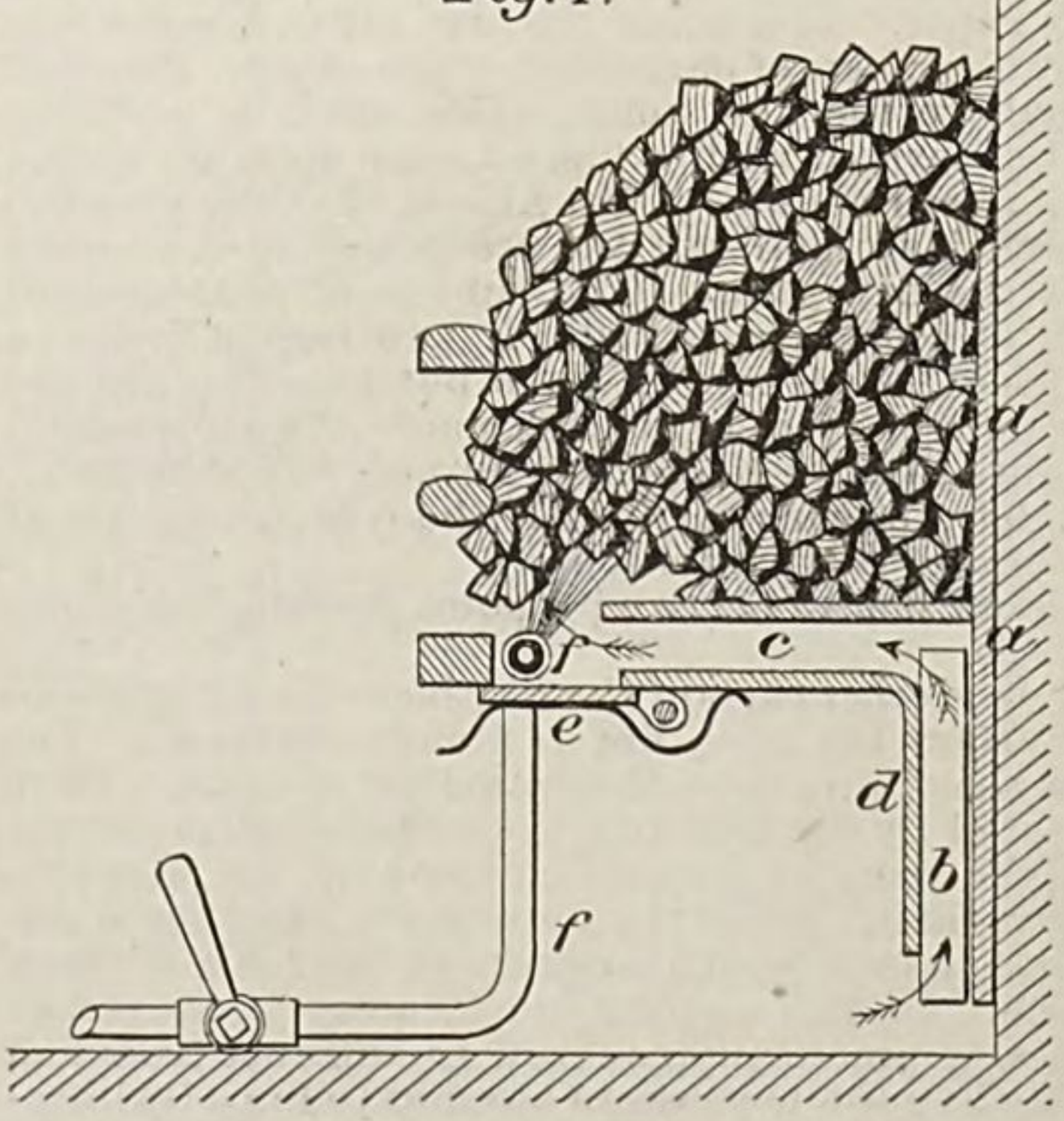
A second method of avoiding smoke in domestic fires is to use smokeless coals in fire-grates, specially adapted for burning them. Where anthracite is much cheaper than bituminous coal, economy forces the public to use the cheaper coal, and the smoke difficulty does not arise. That this is not likely to be the solution in London may be inferred from the experience on the underground railways. There it is easy to use coke or smokeless coal, and there are stringent rules requiring its use; but the Metropolitan and Metropolitan District Railway Companies frequently complain that other companies having running powers over their lines pollute the air of the tunnel by using smoky coal. If the use of smokeless coal cannot be insured on a railway, it never will be in domestic fires. Besides, if the solution is to be sought for in this direction, we have much more to learn from the anthracite coal districts of America than America has to learn from us.

Bituminous coal may be used in two ways: it may be burnt in a fire in its natural state, or we may separate the gas it contains from the coke and use each at our pleasure. A great many open fires have been invented to burn gas only. In all of them there is some good radiating substance which is heated by the gas flame, and which is arranged to look as much like an open coal fire as possible. Various forms of gas fires have long been in use, and found exceedingly convenient on account of the ease with which they are lighted and of the absence of all labor and attendance.

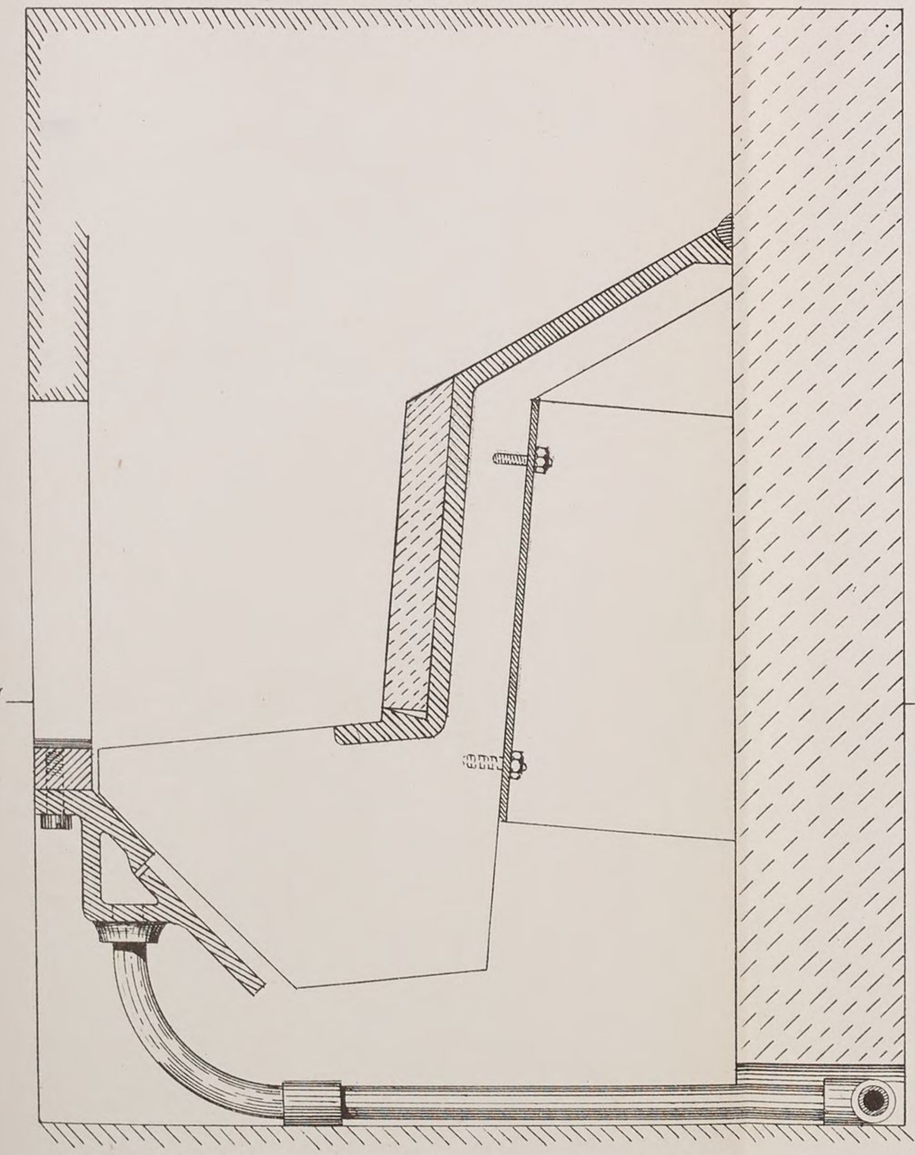
Amongst exhibitors of open gas fires may be named:
Billing & Co., 7 New Oxford street, London.
Browne & Co., 186 Piccadilly, London.
Davis & Co., 200 Camberwell Road, London.
Farwig & Co., 36 Queen street, London.
Leoni & Co., 74 Strand, London.
Pugh Brothers, 97,899 Holloway Road, London.
Sugg & Co. (limited), 1 Grand Hotel Buildings, London.
Waddel & Main, 261 Argyle street, Glasgow.
Webster & Co., Market street, Nottingham.
Wright & Co., 156 Queen Victoria street, London.
Wright & Co., Broad street, Birmingham.

Dr. C. W. Siemens has devised an open fire to burn coke or anthracite coal together with gas, a fire in which smoke is avoided by separating the gas from the coke on a large scale at the gas-works and then burning them together, introducing each into the fire in the most suitable way. As this arrangement presents features of greater novelty than any of the ordinary gas fires, and as it has been taken up by several manufacturers, I describe it in detail, abstracting my description from a lecture delivered by Dr. Siemens at Glasgow.

Fig. 1.

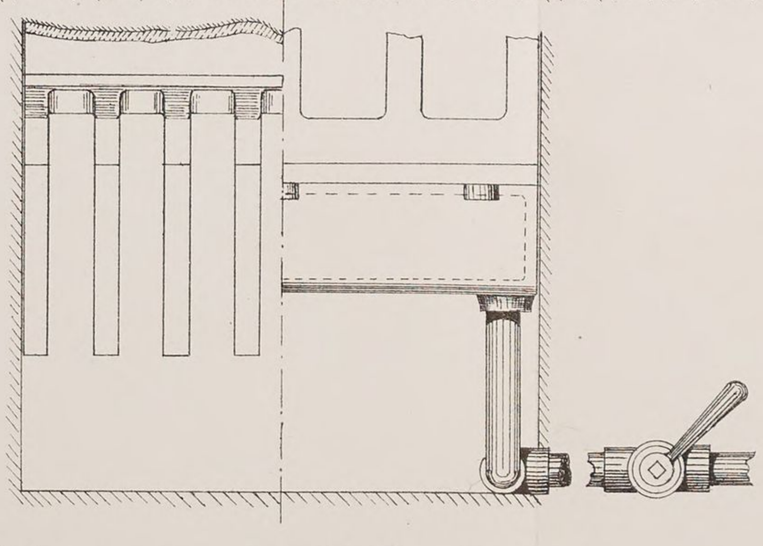


One arrangement of this grate is represented in Fig. 1. The iron dead-plate *c* is riveted to a stout copper plate, *a*, facing the back of the fire-grate and extending five inches both upwards and downwards from the point of junction. The dead-plate *c* stops short about an inch behind the bottom bar of the grate to make room for a half-inch gas-pipe *f*, which is perforated with holes of about one-sixteenth of an inch diameter, placed at distances of one and a half inch along the inner side of its upper surface, at an angle of about 50° from the vertical. This pipe rests upon a lower plate, *d*, which is bent downward towards the back, so as to provide a vertical and horizontal channel of about one inch in breadth between the two plates. A trap-



Section through A.B.

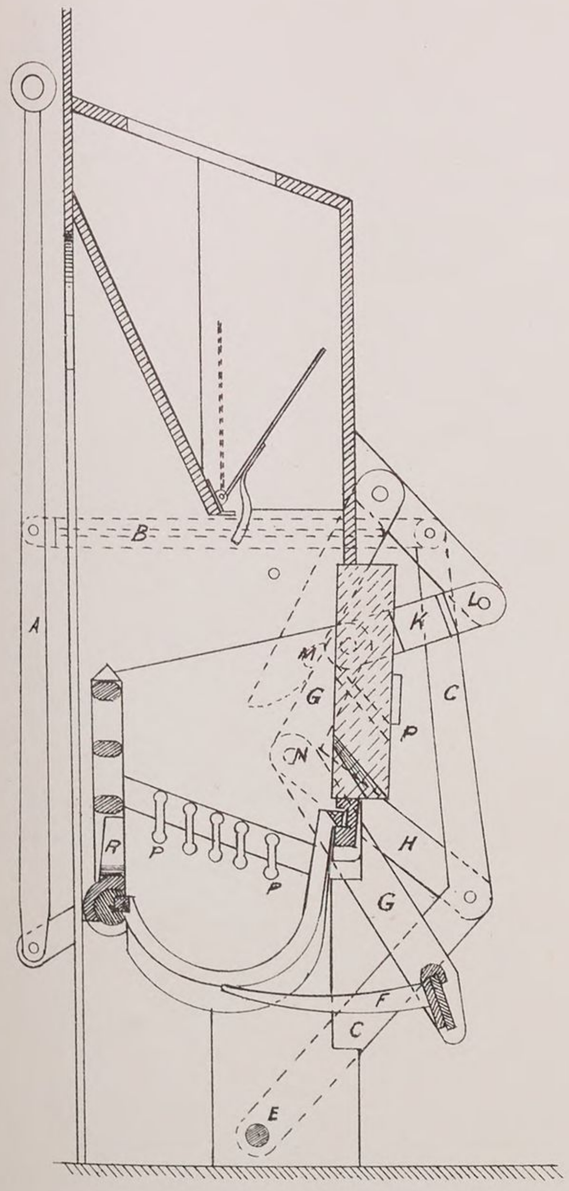
Section through C.D.

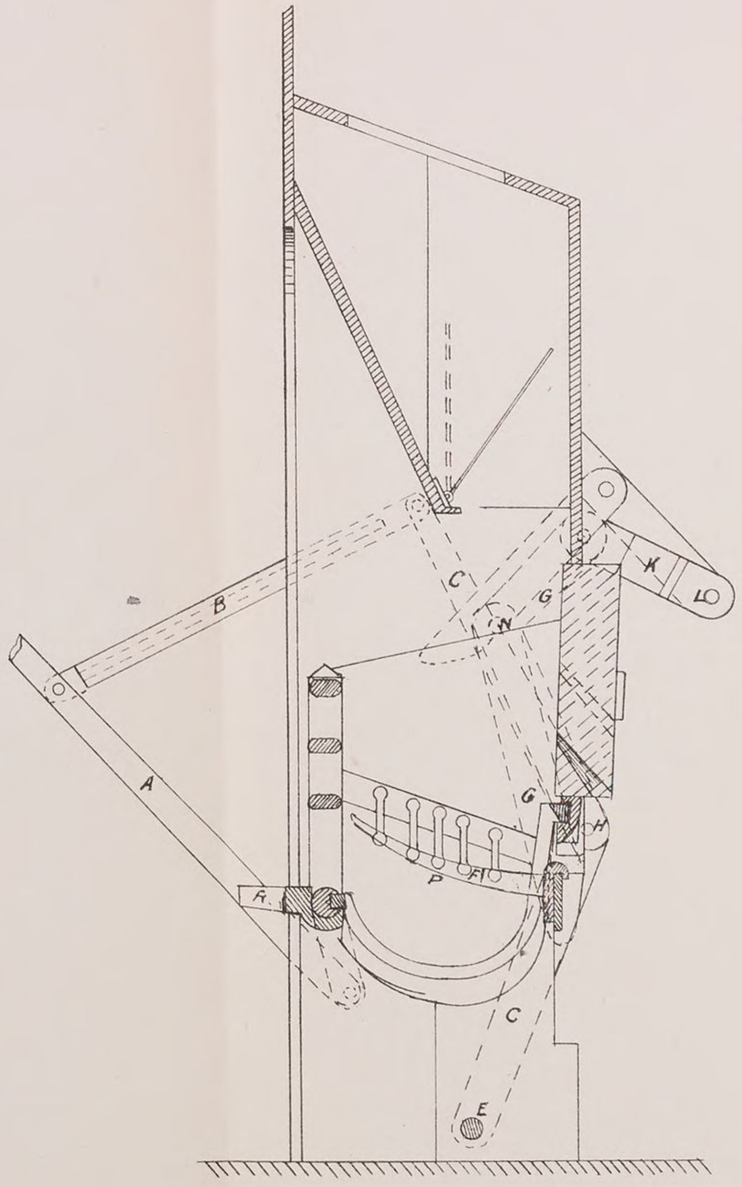


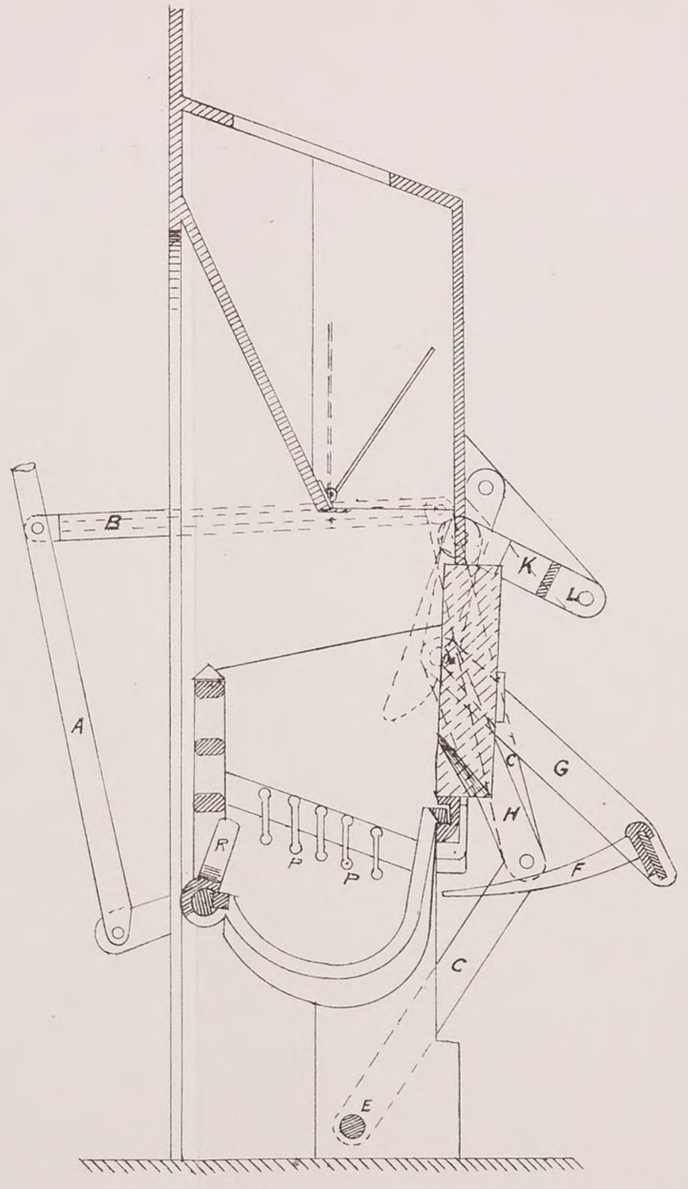
Half Elevation of Bed plate

Half Elevation

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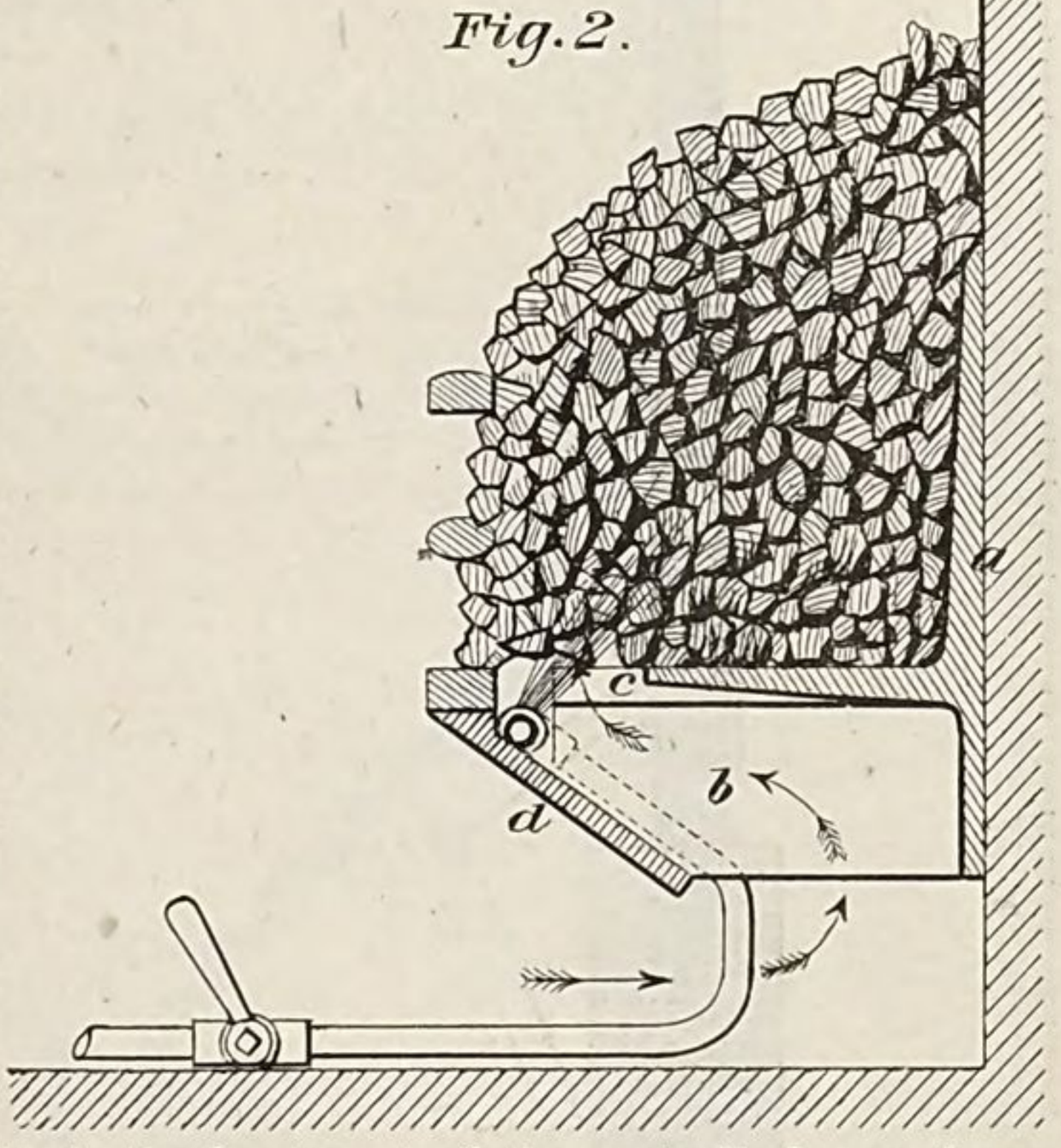


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door, *e*, held up by a spring or counterweight, is provided for the discharge of ashes falling into the horizontal channel.

The vertical channel is occupied by a strip of sheet copper, *b*, about four inches deep, bent in and out like a lady's frill, and riveted to the copper back piece. Copper being an excellent conductor of heat, and this piece presenting (if not less than a quarter of an inch thick) a considerable sectional conductive area, transfers the heat from the back of the grate to the frill work in the vertical channel. An air current is set up by this heat, which, after passing along the horizontal channel, impinges on the line of gas flames and greatly increases their brilliancy. A second and more economical arrangement, as regards first cost, is shown in Fig. 2, and consists of two parts, which are simply added to the existing grate, viz, the gas-pipe *d*, with a single row of holes of about $\frac{1}{16}$-inch diameter, 1.5 inches apart, along the upper side, inclining inward, and an angular plate, *a*, of cast iron, with projecting ribs, *b*, extending from front to back on its under side, which serve the purpose of providing the heating surface produced by the copper plate and frill-work in my first arrangement. An inclined plate, *d*, fastened to the lower grate-bar, directs the incoming air upon the heating surfaces, and provides at the same time a support for the angular and ribbed plate, which is simply dropped into its firm position between it and the back of the grate.

Fig. 2.



The front edge of the horizontal plate has vandyked openings, *c*, forming a narrow grating, through which the ashes produced by the combustion of the coke or anthracite in the front part of the grate discharge themselves down the incline toward the back of the hearth, where an open ash-pan may be placed for their reception.

Fires arranged on one or other of the plans described are exhibited, among others, by:

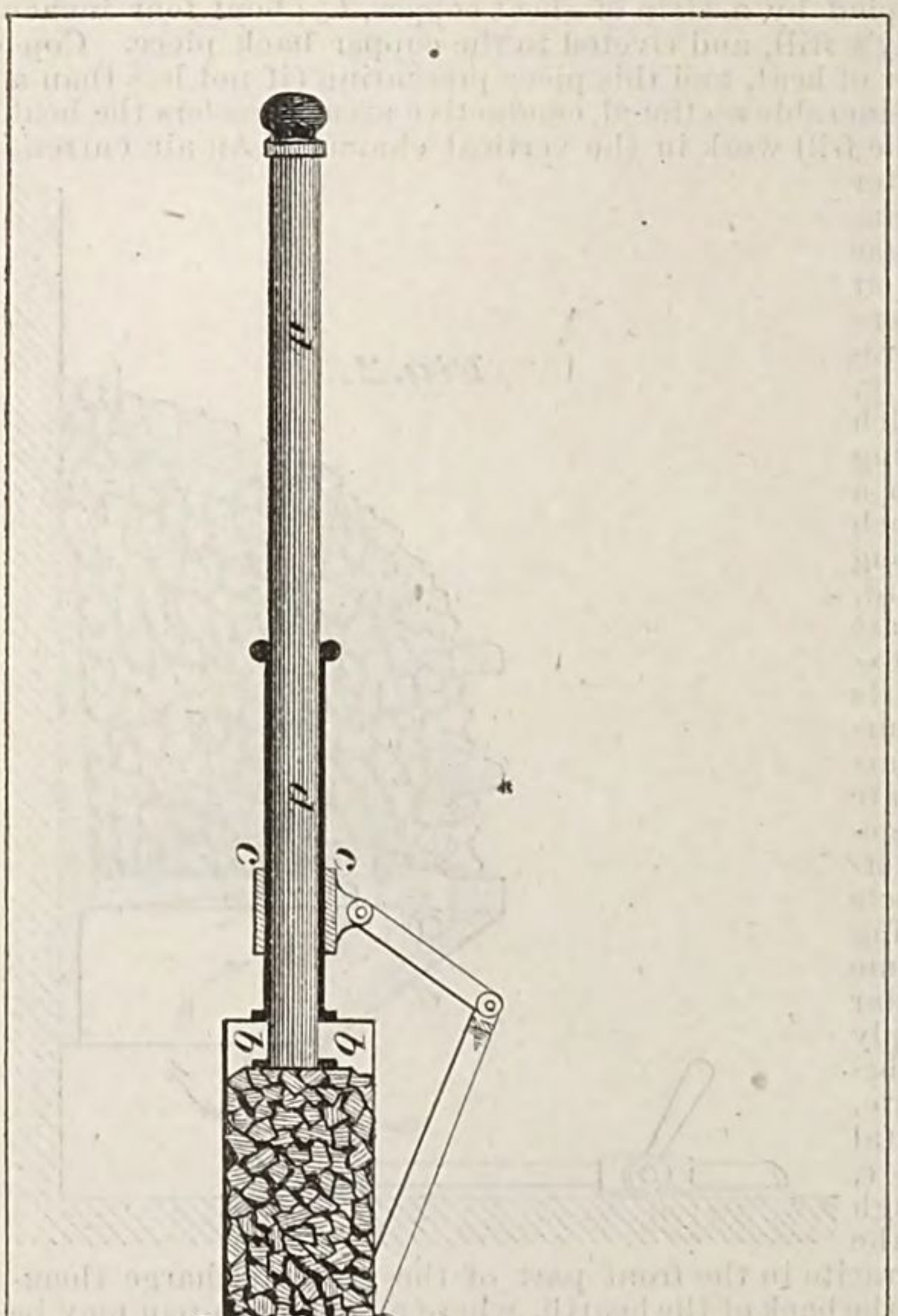
F. Hammond, 5 Chandos street, London.
Falkirk Iron Company, 67 Upper Thames street, London.
Waddell & Main, 261 Argyle street, Glasgow.
Wright (G.) & Co., 155 Queen Victoria street, London.

In comparison with a purely gas fire these fires have the disadvantage that they take longer to become hot, and they produce ash which must be removed from day to day. A gas fire has been arranged with asbestos, in lieu of coke, but retaining the arrangements for heating the incoming air. It is shown in figures following. It is in use at Marlboro' House, and is said to be exceedingly satisfactory.

This arrangement, of course, produces no ash or other dirt, and lights up rapidly. One advantage of a purely gas fire is that it cannot be made to smoke.

In open fires burning bituminous coal the consumption of smoke has been attempted by inventors working upon several different lines. One method is to introduce the fuel under the fire instead of on the top. The most complete device for accomplishing this is that exhibited by E. R. Hollands, of 37 Newington Green, London, N. This grate is in appearance similar to an ordinary register grate. When it is desired to add coal to the fire a handle placed at the side of the grate is drawn forward; the motion of this handle, by means of an ingenious system of links, causes a rake-like set of bars to enter from the back between the lower grate-bars beneath the burning cinders. Pulling the handle further out raises the fire together with the front grate bars, leaving a space below for the reception of fresh fuel; in pushing back the handle the rake-like bars draw back from between the fresh and the burning fuel. The accompanying drawings show the successive positions of the mechanism. The lever A draws forward the connecting-link B and the bent lever C C, which turns on a fixed pin, E. The rake-like bars F are rigidly carried by a cranked piece, G G, which is articulated by a link, H, to the lever C C, and by a second link, K, to a fixed pin, L; when

the handle or lever A is drawn forward the bars F advance below the fire; they then rise directly upward, lifting the fire until the pin N, which connects the piece G G to the link H, drops into the hook or detent M, which serves to prevent the system from returning when the lever A is returned, but compels a direct withdrawal of the bars until the detent meets a stop and releases the pin N, when the system falls into the first position. As the fire is lifted a flap, R, in front of the lower part of the fire opens and leaves an open space to introduce fuel. Holes, P, are arranged to admit air at the sides of the grate above the uncoked fuel. Experience in unskilled hands can alone decide whether so complicated a mechanism is liable to derangement.



W. S. Melville, of Frederick Place, Mile End, exhibits a shovel of special construction for introducing coal under the fire.

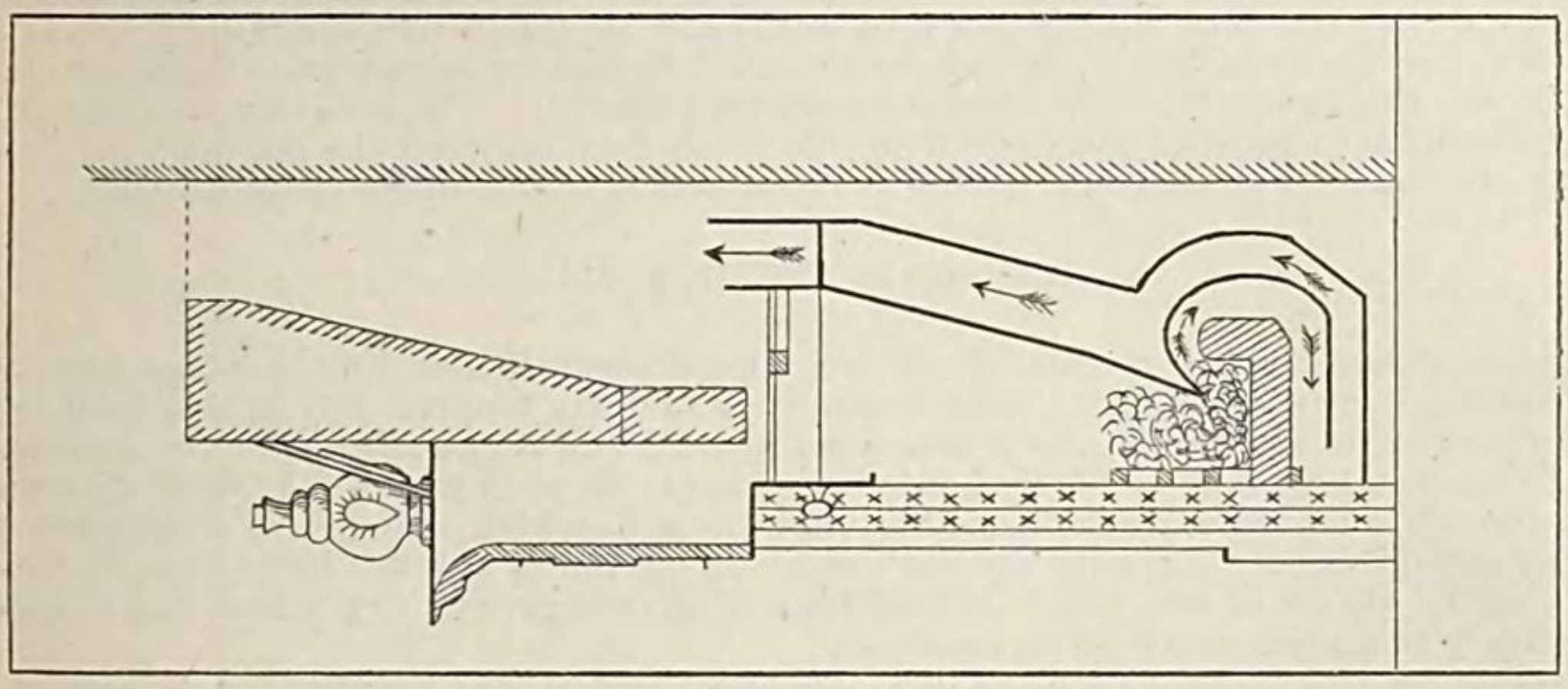
As will be seen by the accompanying sketch, the shovel has a chamber to receive the fuel, covered in front by a flap, *a*, which serves to raise the burning fuel before fresh fuel is thrust in by the piston *b*. The flap is actuated by a slide, *c*, on the handle. The handle is hollow and receives the stem *d* of the piston. When there is sufficient space between the grate-bars to admit the shovel there is no doubt that it can be efficiently used for diminishing smoke. Brown & Green, of Luton, exhibit an open fire in which fresh fuel is introduced from below, in the manner afterward described in their smoke-consuming kitchener. Another mode adopted by many inventors for consuming the smoke of open grates is to draw off the smoke from the lower part of the back of the grate instead of above the fire. An illustration of this system is found in the grate of Clark, Bunnett & Co., of which an illustration is given herewith.

In this case it will be seen that an additional current of air is admitted more completely to consume the smoke. In the grate exhibited by Archibald Smith & Stevens the fuel is introduced from a hopper behind the grate, which need only be filled once a day. The products of combustion are withdrawn at the back in a manner not wholly dissimilar from that last mentioned.

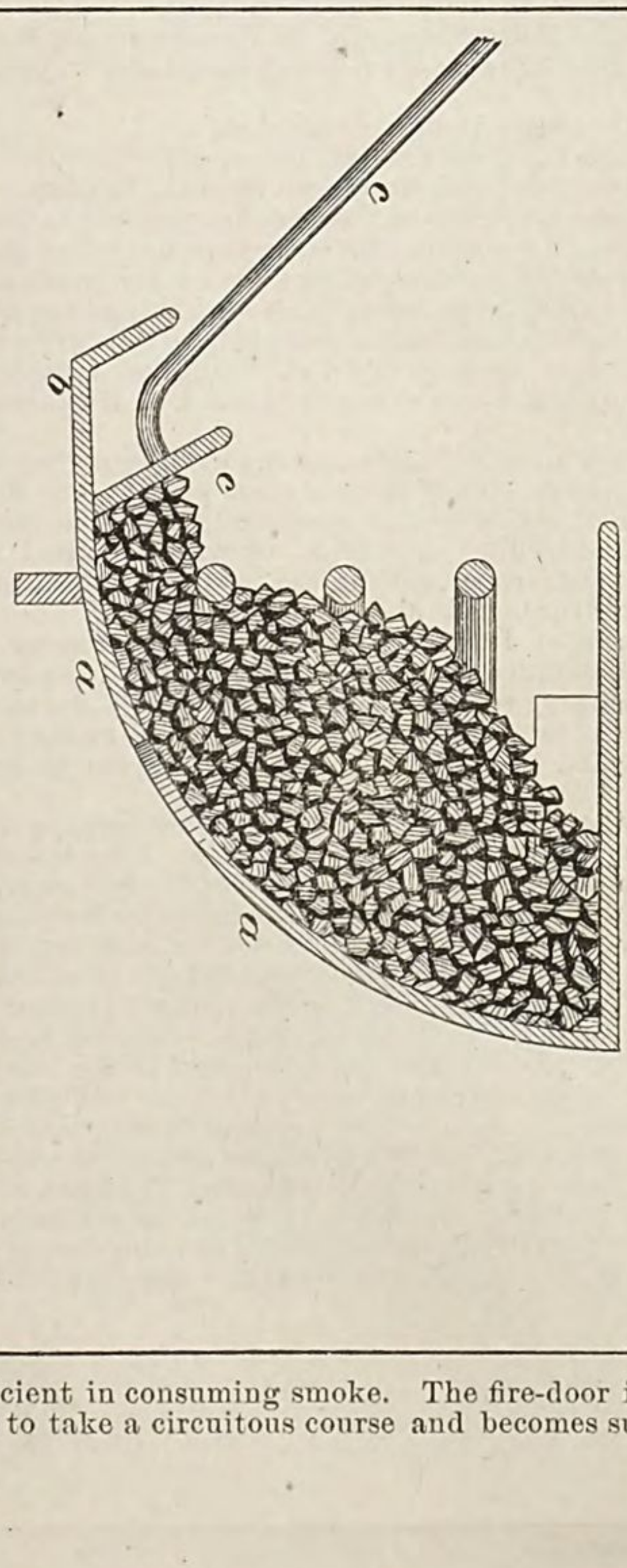
Other modes of diminishing the smoke are also represented, as, for example, by contracting the air space above the fire, and by arranging for the introduction of air more or less heated at the back and sides of the grate.

A great deal may be accomplished in the economy of fuel and abatement of smoke by avoiding thoroughly vicious modes of construction; for example, grates having sides and back of cast-iron instead of fire-brick.

Kitcheners or kitchen ranges.—Just as our rooms may be heated by radiation or by connection of heat, so the cooking of meat may be effected by roasting before an open



fire or by baking in an oven. In the former mode of cooking there appears to be but little improvement. The Radiator Range Company, however, exhibits a kitchen range in which the fire-grate is thrown forward well in advance of the ovens, so as to present as large a surface of hot fuel as possible. With the exception of roasting before the fire, the purpose of a kitchen grate is to heat close spaces to a regulated temperature, and rather to avoid than promote the radiation of heat into the room. As regards the fuel used, we have the same variations as in the case of open fires. Waddell & Main exhibit cooking-ovens heated by gas only. The Siemens grate, combining gas and coke, has been applied to kitchen ranges by Waddell & Main, and also by the Falkirk Iron Company. The latter make use of the arrangement with cast-iron vandykes, and can alter a range at a cost of about 25 shillings. It is only necessary to use gas for about an hour in starting the fire. The coke will then go on burning without using gas. It is said that the cost of coke and gas in a medium-sized range is about 4½ pence more per twelve hours.



Waddell & Main also exhibit what they call their "Treble Combination Range." In the center is an ordinary close fire, heating an oven to the left; on the right is an oven heated by gas, on the top of which are two gas-boiling rings, with separate taps for each. This arrangement would no doubt be useful in hot weather.

T. J. Constantine, 61 Fleet street, London, exhibits a range which is certainly very efficient in consuming smoke. The fire-door is divided into sections, so that the air has to take a circuitous course and becomes sufficiently

heated to consume the smoke. The fire-basket has a number of air-tubes surrounding it also. for the purpose of heating the incoming air.

As already mentioned, Brown & Green show a plan of introducing the fuel at the bottom of the fire. The bottom grate-bars, *a*, form an inclined plane, rising toward the back; in front is a box or shelf, *b*, on which fresh fuel is placed, and is thrust under the fire by means of a suitably formed hoe-shaped shovel, *c*. In addition to consuming the smoke by passing the gases from the fresh fuel between the hot cinders, this range has the advantage that the fuel is introduced without uncovering the fire.

INDUSTRIAL USE OF FUEL.

Steam-boilers.—With very careful stoking a good steam-boiler need produce hardly any smoke, but careful stoking is exceedingly difficult to secure. Mechanical stokers save the labor of the stoker and insure a continuous and regular introduction of fuel. Mechanical stokers may be divided into two classes: those in which the fuel is thrown in uniformly over the surface of the fire, and those in which it is fed in at the front and gradually carried back by the reciprocating motion of the fire-bars. In the former case the pieces of coal which fall far back in the fire give off gas, which has a comparatively small chance of being consumed.

Mechanical stokers are exhibited by Chadderton Iron Works Company, L. Chadderton, Manchester.

Knowels & Halstead Globe Works, Bradford, Yorkshire.

McMillan, J. & J., 57 Scott street, Port Dundas, Glasgow.

Newton & Son, Waterhead Mill, Oldham.

Patent Steam Boiler Company, 28 Henage street, Birmingham.

Piercy & Co. (Henderson's patent), Broad street, Birmingham, and 82 Marble Landing, E. C.

Sinclair, G. Albion Boiler Works, Leith.

Vecais, T. & T., 29 Seel street, Liverpool.

Waller & Co., Holland street, Southwark, London.

The comparative merits of these cannot possibly be ascertained by inspection; actual trial is needed to ascertain the consumption of fuel and the loss from wear and tear. The favorite device for consuming smoke when produced under a boiler appears to be to admit air through the bridge, this air having been heated by passing under the fire. A number of arrangements for accomplishing this, differing only in detail, are exhibited; among them may be mentioned J. Hampton, Loughborough, Ireland, and Lownds Leek; G. Hunter & Co., Leeds; Chubb & Co., Blackfriars, London; E. L. Gowthorpe, Nottingham.

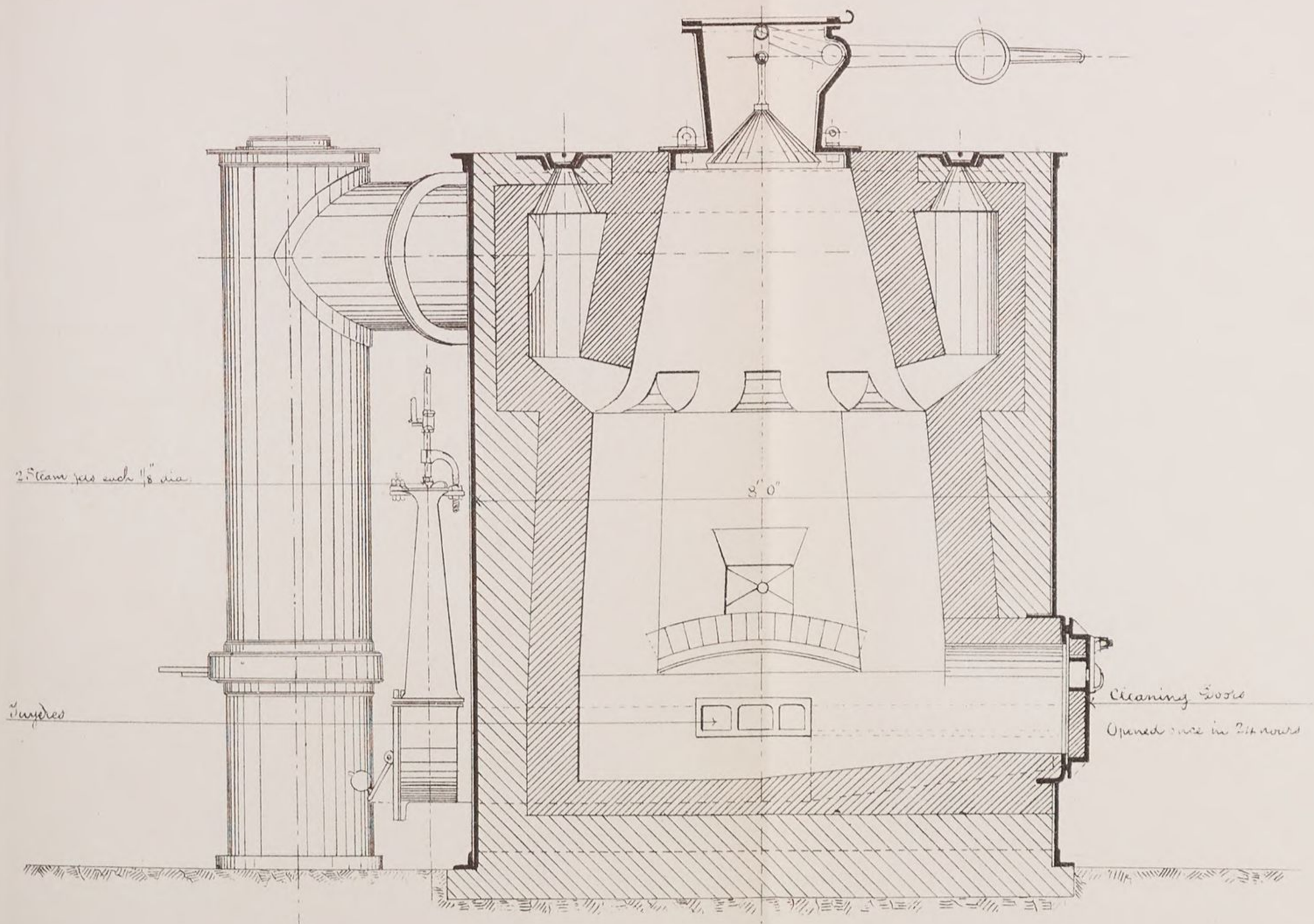
The specialty in many cases consists in the convenience of adapting the new bridge to existing boilers. They none of them present any distinctly novel feature.

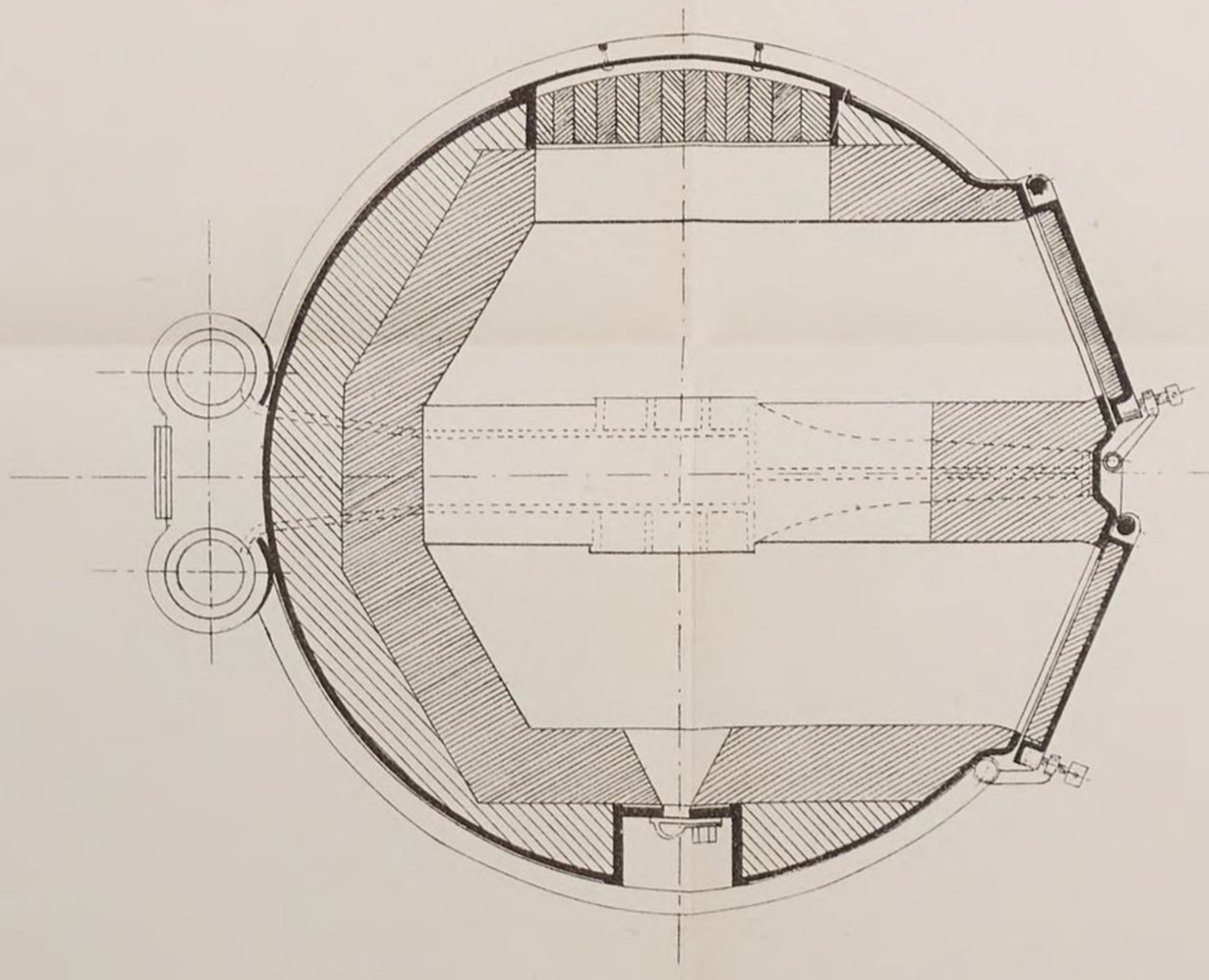
Among other appliances for preventing smoke in steam-boilers may be mentioned McMillan's fuel-feeding apparatus, by which the fuel is introduced from beneath in the center of the furnace, raising the red fuel on the surface, so that the gases from the fresh fuel pass through it and become ignited.

Several forms of furnace-door are exhibited, among which may be mentioned Martin's, which is hinged at the top, and opens either inward or outward to any angle. When set inclining somewhat inward it causes the air to enter the mouth of the furnace at a low point, and to mix with the gases as they are produced. These doors can be easily applied to existing boilers, and appear to be now extensively used in this country.

Probably the greatest reduction in smoke arising from industrial operations has been effected by the regenerative furnace. This system is only illustrated in the exhibition by a model. The application of the system to blast furnaces, glass furnaces, steel making and melting furnaces, furnaces for welding iron tubes, and furnaces for a host of other purposes is now too well known to require description.

An important part in the system is the gas-producer. An improved gas-producer invented by Wilson is exhibited by Mr. Bernard Dawson, of Malvern Link. Appended are drawings of the Wilson gas-producer obtained from Mr. Dawson. A mixture of steam and air is forced into the lower part of the producer, just sufficient air being admitted to maintain the temperature of the producer by partial combustion of the fuel. The ashes are removed only once in twenty-four hours, temporary grate-bars being inserted to sustain the charge of fuel and the steam-blast being taken off. The gas produced, consisting of carbolic oxide and hydrogen diluted by nitrogen, deposits no soot or tarry matter in the flues. I am informed that a producer consuming four hundred-weight of coal per hour gives 147,000 cubic feet of the mixed gases per ton of coal consumed. Such a producer costs about £90, to which must be added £30 royalty.

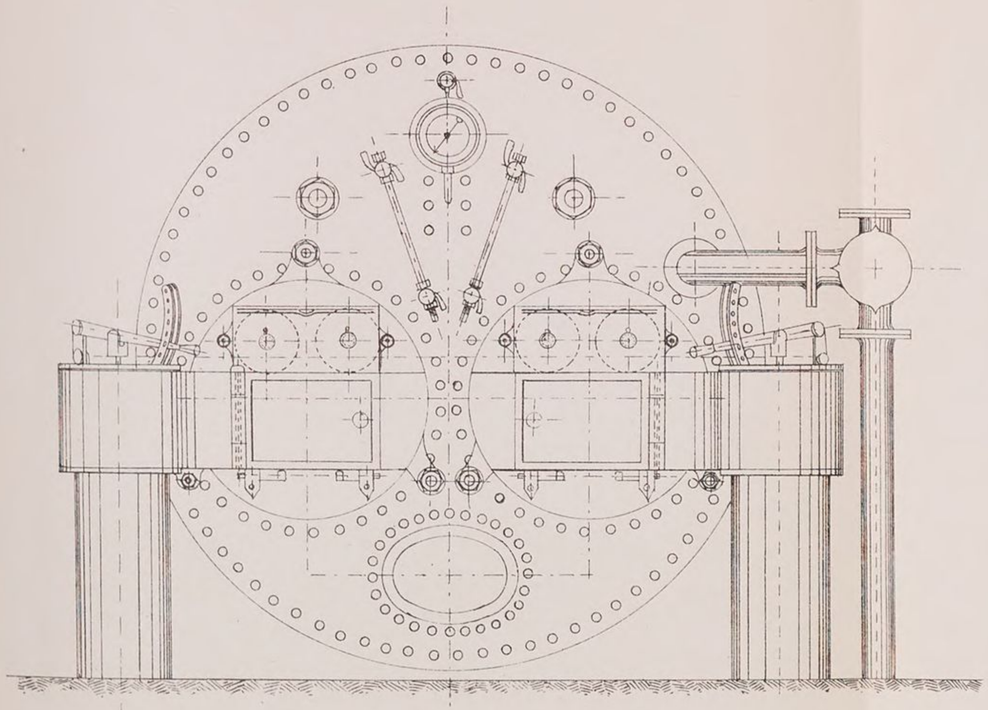




THE WILSON GAS PRODUCER

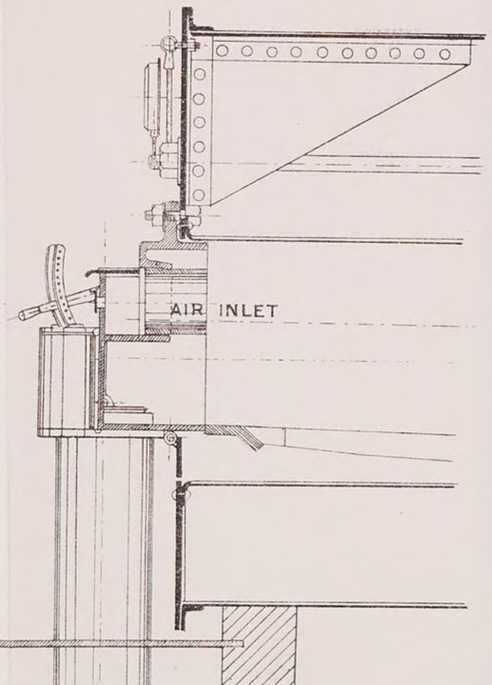
TO BURN 4 CWT. SMALL COAL PER HOUR.

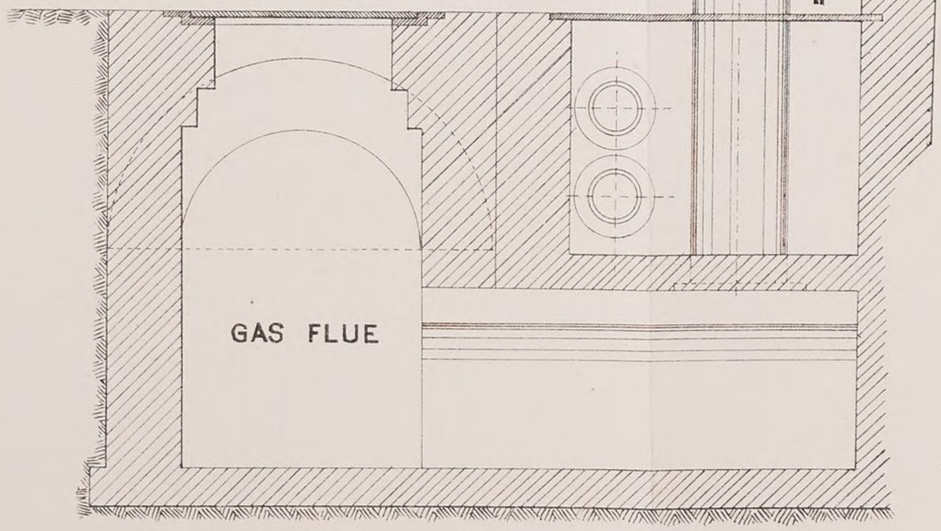
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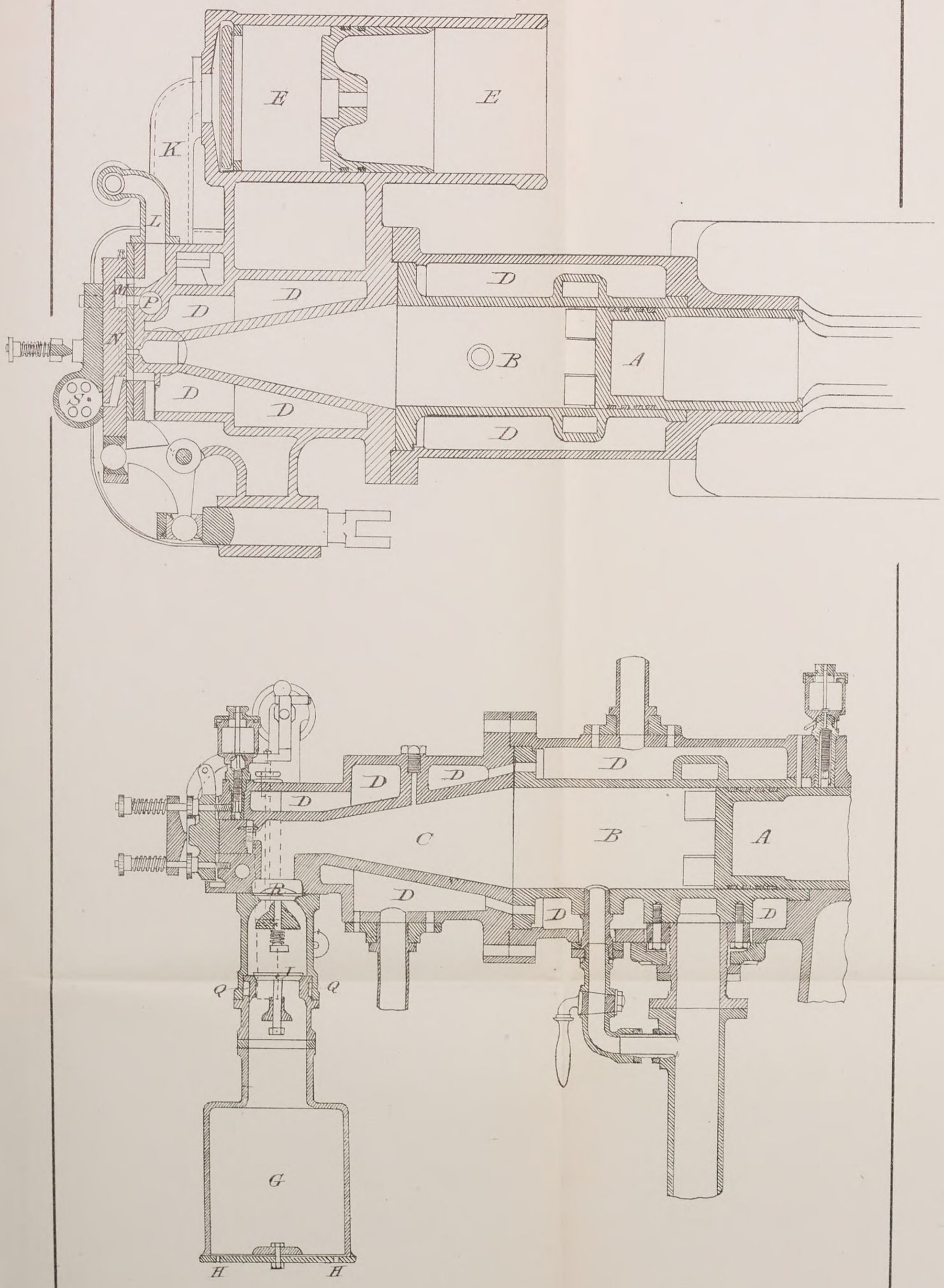
THE WILSON GAS-PRODUCER.

APPLICATION TO BOILER.





SEN. EX. DOC. No. 183, 1st SESS., 47th CONG.


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The following table of analysis of the gas from the producers is given by the exhibition, the numbers representing volumes:

	1	2	3
Carbonic oxide, Co	26.89	23.41	23.60
Marsh gas, CH_4	1.45	2.22	3.05
Hydrogen, H	11.55	13.82	10.55
Nitrogen, N	56.11	55.86	57.55
Carbenic acid, Co_2	4.00	4.69	5.25
	100.00	100.00	100.00
Total percentage of combustible gas	39.9	39.45	37.2

Similar in principle to Wilson's-gas producer is that of Dawson, though adapted fo use on a smaller scale. This producer consists of a cylinder in boiler-plate, lined with refractory material. At the bottom of this cylindrical chamber is a small grate, upon which lies the fuel. There is a closed chamber under the grate, into which a jet of superheated steam blows as an injector, carrying a suitable quantity of air with it. The fuel is fed into the combustion-chamber from a hopper above. The grate is so arranged that it can drop entirely into the chamber below for the removal of any clinkers which may have formed or for change of grate, without disturbing the rest of the apparatus. The steam is superheated by a coil of pipes, through which it passes, and should be at a pressure of about 25 pounds to the square inch. Anthracite coal is the best fuel for this producer. For many purposes a gas-holder and a purifier, with hydrated oxide of iron to remove sulphuretted hydrogen, are added. The composition of this gas is said to be by volume:

	Per cent.
Hydrogen	20
Carbonic oxide	30
Carbonic acid	3
Nitrogen	47

Twelve pounds of anthracite coal yields 1,000 cubic feet of this gas. This producer is now being used in connection with gas-engines, the proportion of gas to air being suitably increased.

Gas-engines are exhibited by—
J. E. H. Andrew, Stockport, Bisschop engine.
Crossley Brothers, Manchester, Otto engine.
Lewis & Lewis, London.
J. C. Stark & Co., Torquay.
Thomson & Sterne, Glasgow, Clerk's engine.
H. Wurr & Co., London Wall.

Among these, Thomson & Sterne's, being both novel and excellent, is worth describing. The accompanying figures show the working cylinder and its connections in sectional plan and sectional elevation. The engine is single-acting, making an explosion every revolution when working to full power. A is the working piston; B is the working cylinder with a conical extension, *c*, and jacketed with water in the space D. E is the displacer cylinder, having a capacity about double of the product of the area of the working piston and the stroke. Into this cylinder is drawn a mixture of air and gas for the first half of its stroke, and air only for the latter half, so that the displacer first drives out the products of combustion through the exhaust-ports F, and then charges the combustion space with mixed gases, which are compressed by the return stroke of the piston A. The air enters the space G by the holes H, passes the check-valve J, which opens upward thence by the pipe K to the displacer cylinder E. The gas enters by the pipe L through the ports M in the slide N, which serves to cut off gas at the proper moment, through the pipe P, in which is a valve controlled by the governor, to an annular space, Q, surrounding the check-valve J; from this point the gas mixes with the air until its admission is cut off either by the slide N or the governor-valve. The charge passes back by the pipe K through the check-valve R into the combustion-cylinder. The ignition is effected with certainty through ports in the slide N from a bunsen flame, S.

The advantages claimed for the engine in comparison with that of Otto & Langen, which now commands the greatest sale in England and on the Continent, are greater regularity, owing to the power being generated every revolution instead of every other revolution, and less weight and size for the power generated.

Thompson Brothers, of Queen Square, Leeds, show an excellently-arranged gas-kiln for burning stained and enamel colors on glass and pottery; also a baker's oven heated economically by gas.

In the conservatory of the Horticultural Gardens is an extensive exhibition of the gas-burners invented by Frederick Siemens, of Dresden. There is also an exhibition by Dr. C. W. Siemens of his method of melting steel by the electric arc. Both of these exhibits, though of an intrinsic interest exceeding that of much that is herein described, are perhaps less directly connected with the prevention of smoke. I can, however, easily add particulars of each if this is thought desirable.

In concluding this report I have to state that in selecting certain exhibits for description I do not wish to express any opinion that they are superior to others not here described. My purpose has simply been to take those which appeared most convenient for illustration. The experimental trials which have been going on at South Kensington for some weeks will give an insight into the relative efficiency of different appliances impossible without experiment. I have inspected the arrangements for testing domestic appliances; they comprise determinations of temperature in different parts of rooms of a convenient size, measurements of the quantity and temperature of the gas passing up the chimney, and analysis of their composition. The experiments on kitcheners have been superintended by a skilled cook from the school of cookery. I am informed that the results of these systematic trials will be published as a report. Mr. W. E. Coles and Mr. Kinnear Clark have shown me much civility, and have given me much aid whenever I have visited the exhibition for the purpose of preparing this report. I take this opportunity of expressing my obligations to these gentlemen.

J. HOPKINSON.

February 27, 1882.
4 WESTMINSTER CHAMBERS, VICTORIA STREET,
London, S. W.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 184.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A communication from the Chief of Engineers of the 21st instant, and the accompanying copy of the report of Capt. Charles F. Powell, Corps of Engineers, upon a survey of the Columbia River at the Dalles, in Oregon.

JULY 25, 1882.—Referred to the Committee on Commerce and ordered to be printed.

WAR DEPARTMENT,
Washington City, July 24, 1882.

The Secretary of War has the honor to transmit to the United States Senate, for the information of the Committee on Commerce, a communication from the Chief of Engineers of the 21st instant, and the accompanying copy of the report of Capt. Charles F. Powell, Corps of Engineers, upon a survey of the Columbia River at the Dalles, in Oregon, made in compliance with requirements in the river and harbor act of March 3, 1879.

WM. E. CHANDLER,
Acting Secretary of War.

The PRESIDENT *pro tempore*
of the United States Senate.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., July 21, 1882.

SIR: I have the honor to submit herewith a copy of a report to this office of the results of a survey made, to comply with requirements of the river and harbor act of March 3, 1879, under the direction of Maj. G. L. Gillespie and Capt. C. F. Powell, Corps of Engineers, of the Columbia River at the Dalles, in Oregon, including plan and specifications for locks and canal around that locality.

Very respectfully, your obedient servant,

H. G. WRIGHT,
Chief of Engineers, Brig. and Bvt. Maj. Gen.

Hon. ROBERT T. LINCOLN,
Secretary of War.

SURVEY OF THE COLUMBIA RIVER AT THE DALLES IN OREGON.

UNITED STATES ENGINEER OFFICE,
Portland, Oreg., May 30, 1882.

SIR: I have the honor to submit the following report upon a survey of the Columbia River at the Dalles, Oregon and Washington Territory, with a project for improvement for navigation:

A survey at the Dalles, Oregon, with plan and specifications for canal and locks, was required by act of Congress of March 3, 1879.

The principal part of the field-work of the survey now reported upon was performed between October, 1879, and January, 1880, by direction of Maj. G. L. Gillespie, Corps of Engineers, officer in charge, and under my supervision.

Subsequently and at various times additional surveys and examinations were made of special localities, to furnish results more detailed than ones obtained by the main party, and also for studying the variable phases of the river during its widely different stages.

An excellent instrumental examination had been made in 1874 by Assistant Engineer R. A. Habersham, and under the orders of Maj. N. Michler, Corps of Engineers. A map on a scale 1: 7,200 was plotted from this examination. No definite project for an improvement, however, was prepared. The obstacles to be overcome were briefly described in a report, and some plans were suggested. The time of the examination was necessarily too brief to include all the varying features which enter into this grand and useful work, and to give the data for solving this difficult problem of engineering, which appears at first sight, as stated by Major Michler, almost insurmountable.

The examination paved the way for a detailed survey, and the map of the former furnished a good groundwork on which to arrange the latter.

One month preceding the commencement of the survey, permanent water gauges were established, and from that time read daily, as a rule, until June, 1881. All the gauges are on the Oregon side. No. 1 is fixed on the railroad incline at Celilo; it marks the level of the river next above Turnwater as locally known, or Celilo Falls, as given on our maps. Gauge No. 2 is at the foot of the Falls. No. 3 is at the head, and No. 4 at the foot, of the Five-mile, or Dalles Rapids proper. No. 5 is on the railroad incline at the city of The Dalles. The Ten-mile Rapids is about midway between gauges 2 and 3. The Three-mile Rapids or Narrows is about midway between gauges 4 and 5. Gauges 1 and 5 are at termini of present navigation.

The survey was based on a triangulation and a circuit of duplicated levels covering both banks of the river from Celilo to the Dalles. There were one hundred and twenty-two trigonometrical stations, equally distributed on both banks and generally placed above mean high-water. As a rule the stations were marked by 0.5 or 0.75-inch drill holes in the natural rock, thus insuring permanency for use during construction or subsequent surveys. A triangle was cut around the holes, and adjacent stone pyramids erected for prominent surface marks. Consecutive stations were generally intervisible. The elevations of the trigonometrical stations were determined for convenient use in topographical work, and to furnish a series of well-located bench marks, on both shores, throughout the whole reach of the survey.

Four base lines were measured. The true meridian was determined near Celilo. Observations were made for magnetic declination near the

Dalles. Connection was established with three land-survey points—one near Celilo, one near Five-mile Rapids, and one near the Dalles.

The water surface was leveled to at sounding stations and also at principal breaks. The high-water line of 1879, which had remained plainly visible on the banks, and the high-water marks of 1876 at Celilo and at the Dalles, were included in the levels. The stage of 1879 is that of mean high-water. The flood of 1876 is the highest known to white inhabitants.

Topography was run with the stadia and was extended to the foot of the bluffs, or where the valley widened, as it does near the Dalles, to include all overflowed land. On the upper half of the region of survey topography was plotted in the field on specially prepared sheets. On the other part the advanced state of the winter season made necessary a resort to sketching in the field-book, without curtailing, however, the field-notes.

Soundings were taken wherever the current made the use of a small boat safe. Above the Falls, sounding stations were built 400 feet apart on both banks; zigzag lines were run between the stations and soundings made at regular intervals of time. Below the Falls the current is too swift to keep a boat on a given short range across the river. Straight lines were, therefore, made as nearly perpendicular to the current direction as practicable; the ends of the lines were marked with stakes after reaching shore. The nearest gauge was read before and after each set of soundings. Levels were run to the sounding stakes as soon after the sounding as practicable, and the gauges read at times of such leveling.

Surface velocities of current were obtained at principal places during stages near extreme ones.

Gauge stations were inspected occasionally. Gauge readings were plotted monthly and care exercised to detect errors. Some few suspicious results were rejected entirely. From the unusual height of the winter freshet of 1881 it was correctly judged that the following summer rise would not reach a mean, and consequently add but little value to the high-water observations already obtained. Readings to the end of February, 1881, were therefore submitted to an analysis for determination of slopes at different stages, and for compilation of tables of convenient reference.

The period of gauge observations included the flood of 1880, which was the third highest known to white inhabitants, and which was only 2.7 feet at Celilo below the great flood of 1876. Two winter low-waters, when the upper river was closed by ice, and an unusual spring low-water of 1880, when the river was full, were also included.

For the analyses, all readings had been previously reduced to the datum plane; those of gauge 1 were arranged in nearly consecutive order from the lowest to the highest. In parallel columns and on the respective horizontal lines were placed observed corresponding results of other gauges. Gauge 1 was then compared with each of the other gauges and the readings separated into groups, so that the range was small and the number of results in the groups was reasonably large. The limit of range was taken as 1 foot on gauge 1; the average range on the same gauge is 0.74 foot; the average number of results in all the groups is 16.2. The means of corresponding groups in each comparison were considered as rectangular co-ordinates of points of a line, which would represent, by absissas and ordinates, corresponding readings on the two gauges under consideration. Through points plotted by each series of such co-ordinates the mean curves were drawn. The

curves were extended to extreme high-water as found by leveling to reliable marks of the 1876 flood, and to an extreme low-water as transferred by deduction from the Cascades Canal, where such a stage had been definitely fixed. For this deduction two periods of observation on the Dalles gauges and on the Cascades gauge number 1 were selected, when the river was low and during a time of little change and no rain. Each period included eight days' observations. The mean of the Cascade readings for one of the periods was 1.7 feet above extreme low-water, and for the other period 3.2 feet. Simple proportions gave readings on the Dalles gauges corresponding to the low-water reference adopted at the Cascades.

From the plot of the curves of corresponding readings on gauge 1, with those on gauges 2 to 5, tables were made, which give readings between extreme high-waters on the other gauges for each foot on gauge 1.

These tables and levels to the river surface at points between the gauge stations give the data for a profile of water surfaces.

To avoid confusion only characteristic stages were plotted. The project for the Cascades Canal contemplates improvement for navigation from low water to a reading of 20 feet on Cascade gauge No. 2. The stage corresponding to this, at the Dalles, is shown on the profile. Readings of that stage, on the Dalles gauges, were deduced in this way: a period of ten days was chosen when the river was nearly at a standstill, and the mean of whose daily readings exactly marked the 20 foot stage at the Cascades; considering that one day was required for water to flow from the Dalles to the Cascades, a distance of nearly 50 miles, the corresponding mean was taken at the Dalles gauge No. 5; for the other gauges interpolation was made in the table.

The profile sheet of water surfaces also shows the river bottom along the line of deepest soundings.

RIVER DESCRIPTION.

The bed and permanent banks are of basalt. The rock is full of seams and fissures, and overlaid, in places, by gravel, shingle, and cobblestones. Between high and low water lines there are large areas covered with shifting sand-dunes.

The trough of the low river is from 10 to 60 feet deep. The depths through the Dalles Rapids, where sounding is impracticable, were computed to vary from 30 to 40 feet. The sides of the trough are generally precipitous, and in many places vertical and from 40 to 80 feet high. The widths vary, at low water, from 125 to 2,500 feet, and from 1,250 to 4,500 feet at flood stage.

Surface current measurements, made at stages of from 4 to 5, and from 40 to 44 above low-water at gauge 5, and which are nearly mean low and high stages, give the following results: Low-water velocities vary from 1.2 to 12.7 miles per hour; and high water ones from 5.1 to 18.8 miles per hour. Velocities in detail are given in accompanying tables.

The total fall from Celilo to the Dalles (city), a distance of 13.6 miles, is:

	Feet.
At extreme low-water	81.4
At mean high-water (flood of 1879)	61.7
At extreme high-water (flood of 1876)	56.5

The slope at any one stage is not uniform, as shown by the profiles of water surfaces. At the lowest stage, beginning at Celilo,

For 9,000 feet, the slope is 1 : 9000; then a vertical fall of about 20 feet,—middle of Celilo Falls.

For 2,000 feet, the slope is 1 : 75.

For 1,900 feet, the slope is 1 : 158.
For 10,900 feet, the slope is 1 : 2870.
For 5,400 feet, the slope is 1 : 720. Ten-Mile Rapids.
For 5,200 feet, the slope is 1 : 2080.
For 1,800 feet, the slope is 1 : 487.
For 6,800 feet, the slope is 1 : 2430.
For 5,200 feet, the slope is 1 : 520. Dalles Rapids.
For 3,000 feet, the slope is 1 : 3000.
For 28,800 feet, the slope is 1 : 14857.
At mean high stage :
For 5,000 feet, the slope is 1 : 10000. Celilo Falls.
For 400 feet, the slope is 1 : 160.
For 5,600 feet, the slope is 1 : 1400.
For 11,300 feet, the slope is 1 : 7060.
For 5,700 feet, the slope is 1 : 1055. Ten-Mile Rapids.
For 15,000 feet, the slope is 1 : 21429.
For 1,800 feet, the slope is 1 : 138. Dalles Rapids.
For 1,700 feet, the slope is 1 : 1700.
For 1,700 feet, the slope is 1 : 154. Dalles Rapids.
For 2,400 feet, the slope is 1 : 267.
For 10,600 feet, the slope is 1 : 964.
For 10,800 feet, the slope is 1 : 5400.

The profile at the extreme high-water does not vary much from that at mean high stage; the slopes of the former are somewhat less than those of the latter, from Celilo to the head of the Dalles Rapids; below, the slopes of the two stages are nearly equal.

The serious obstructions to navigation are Celilo Falls, Dalles Rapids, and Ten-Mile Rapids. The Three-Mile Rapids and another minor rapids, about 2 miles above the Dalles Rapids, offer but little difficulty at any stage, even to ascending steamers; velocities at the latter minor rapids decrease as the river rises, and the difficulty to navigation disappears entirely at mean high-stage. At the Three-Mile Rapids, velocities are the least at low stage; they increase, however, as the river rises. Wherever soundings appear on the maps transmitted herewith, navigation may be considered easy at all stages.

The ledge of rock forming the Celilo Falls juts out from the left bank 1 mile below the Celilo landing, and extends directly down stream for nearly 1.75 miles. Large openings at the shore end of the ledge make the partial fall known as the Horse-shoe, and whose waters escape to the river below through the deep narrow chute made by the ledge and the rock walls of the Oregon side. The main volume of river flows over and through depressions of a wide ridge, at right angles to the current, and which joins the ledge near its lower end, with a rock plateau on the Washington side. The ledge, ridge and plateau are completely covered at the higher stages of river. Extreme rise of the upper level is 28.3 feet, and of the lower level 72.3 feet. The total fall at the extreme lowstage is 47.2 feet, and consequently only 3.2 feet at extreme flood.

From the basin, where unite the two main parts of Celilo Falls, there is a good boating river, for two miles, to the head of Ten-Mile Rapids. This obstruction is a chute 0.5 mile long, from 200 to 300 feet wide, with vertical sides from 60 to 70 feet high, and through which flows the entire river at stages lower than about 20 feet, locally. A portion of a higher river passes through a channel on the north side, formed by a natural depression in a rock plateau. The velocities of the low river and of the high-water channel are equal and about 7.5 miles per hour. The current is not so much of an obstruction as the disturbance of water produced by an irregular cross-section and submerged rocks, which cause swirls, and strong eddies. A boat cannot

be held steadily on her course, but is rendered liable to be dashed against the rock sides or forced on the reefs.

Three and one-quarter miles further down is the head of the Dalles Rapids. The name is said to be derived from Canadian French, D'aller, meaning a mill-race. Next in advance of the rapid, the river is wide and somewhat shoal; the low and sandy banks here are the mouths of deep ravines extending into the bluffs. Walls of rock put out from the river sides at right angles to the current forming the head of the rapid. The gorge is 8,000 feet long and from 125 to 350 feet wide. The sides are precipitous and from 40 to 60 feet high; between them flows the entire volume of the Columbia at the lower stages.

A rising river on reaching 30 feet above low-water begins to escape through two side channels—one on the right near the head, and the other on the left near the middle of the chute. The flood river spreads over the walls, but their height and the narrowness of even the high river cause floods to back up almost to Celilo. The extreme rise at the head of the rapid is 87 feet, and at the foot 66.6 feet. The low-water fall, in the rapid, is 11.2 feet; the maximum fall, 35 feet, occurs at a stage about mean high water. Near the lower end there are several dangerous rocks in the rapid, and at the foot large masses of rock divide it into different parts; the main channel empties into a capacious, deep basin of rectangular shape, called the big eddy. The river leaves this basin at right angles to the direction of the rapid, and again quickly turns another sharp corner. Up-stream navigation of the rapid at low stage, and a down-stream passage during high river only are possible. Navigation cannot even for possible cases be made practicable without extensive radical improvement.

Below Three-Mile Rapids navigation would be easy. In fact, 1 mile above the Dalles, landing is the mooring place or harbor for craft not in use.

The bottom of the river from Celilo to the Dalles is a succession of deep pockets and high ridges; the latter are natural submerged weirs, over which the low river falls with greater or less slopes, depending upon the relative elevations of consecutive dams. The profile sheet of water surfaces plainly shows this condition of river regimen. For the same locality changes of slopes at different stages are due to engorgements of the river, or, in other words, changes of relative lengths and average heights of the dams.

The gauge-tables transmitted herewith show the difference of river surface elevations between gauge stations, with horizontal distances, for different stages of river.

The distance from safe water above Celilo Falls to navigable river next above the Dalles landing is 56,200 feet; the total fall, at low stage, is 80.7 feet; this fall decreases gradually to flood stage, when it becomes 53.2 feet.

ATTEMPTS IN NAVIGATION.

Several craft have made the trip from the Upper to the Middle Columbia, and generally with safety. The passage from Celilo to the head of the Dalles Rapids is made during high-water, and through the Dalles at low stage. A notable case, as showing the extent of possible navigation on the Snake River and partly on the Columbia, is that of the steamer Shoshone. This boat was built on the Upper Snake for the Boise country trade, before the construction of the Northern Pacific Railroad. She navigated, without difficulty, a reach of 170 miles, and afterwards made the passage of the Great Cañon of the Snake, the Dalles

obstructions, and the Cascades, and was subsequently used on the Upper Willamette. The distance, by river, from the highest point reached on the Snake to the present head of navigation on the Willamette, is 841 miles. The steamer Harvest Queen is the last boat brought down from Celilo, February, 1881. She jumped the falls at the low stage, for such an attempt, of 10.6 feet on gauge 1, and 53.9 feet on gauge 3. Her wheel, rudders, and machinery were damaged, the boat rendered unmanageable, and prevented, with difficulty, from being carried into the Dalles Rapids. A little later, when the river had fallen to a stage of 22.4 feet at gauge 3, the steamer finished the passage without a scratch.

No steamer has attempted to ascend the Dalles Rapids. Before the time of steam navigation, however, bateaux were taken up. Captain Silas Smith, a river pioneer, states that in March, 1858, when the river was doubtless not below a mean low stage, he took a bateau fleet to the foot of Celilo Falls; each boat carried two tons and was manned by four men; at the Dalles the crew doubled, and cordelled the loaded bateaux through the rapids.

Mr. Lawrence Coe, who was formerly interested in Dalles steamers, assures me that several years ago one of his boats, and of a kind less powerful than steamers now in use, ascended the Three-Mile Rapids without difficulty during low stage.

The government launch, stationed at the Cascades, and whose speed is only 10 miles per hour, steamed from the Dalles to the Big Eddy, July, 1881, during a stage of 47.5 feet at gauge 3. Some difficulty was experienced at the Three-Mile.

During September, 1881, the small steam ferry-boat belonging at the Dalles went to the Big Eddy with ease; gauge 3 read 38.1, or a stage of 17.6 feet.

CHARACTER OF RIVER AND NAVIGATION BELOW THE DALLES AND ABOVE CELILO.

The Middle Columbia, as the reach is named from the Dalles to the Cascades, has a good 8-foot channel at an extreme low-water, whose average annual duration is very short. Steamers plying here are large and powerful. Barges are much used; they are fitted with sails and frequently sail up-stream; winds prevail in that direction, except during winter. There are several lumber and wood scows on this reach. Through river traffic is much decreased now, on account of the late completion of a railroad from the the Dalles to the Cascades. For that reason one steamer was taken over the Cascades for service elsewhere. A second steamer, and the largest of the fleet, is in readiness for transfer to the lower river. The rail portage on the Washington side is still maintained, and passengers have a choice of boat or rail. The new railroad on the Oregon side is a single-track one, and will almost necessarily remain so; it is subject to breaks from snow blockades, land slides, and from a stretch of treacherous bed near the present lower end of the line.

The government has commenced a navigation improvement at the Cascades, consisting of a canal with lock and extensive open river work along the lower approach. The project is intended to give navigation during low and medium stages of river, lasting about one-half of the year, and is arranged for convenient development into a high-water system; $540,000 have been appropriated, so far, for this improvement.

Below the Cascades to the mouth of the Willamette, the present head of ship navigation on the Columbia, the river, 51 miles in length, has a

natural capacity for navigation, fully as large as the middle river. The same class of steamboats and barges ply here as there. Below the mouth of the Willamette and on that river to Portland, Oreg., are found first-class craft of all kinds—river, coasting, and foreign trade. A more detailed description of the middle, lower, and also upper river, with dimensions and numbers of river craft, is given in a paper accompanying the report of the Board of Engineers on the Cascade Canal, of November, 1880.

THE UPPER COLUMBIA.

Present navigation on the Columbia and Snake rivers, from Celilo up, is continuous to Lewiston, 266 miles; and also from the mouth of the Snake to Priest Rapids, on the Columbia, 73 miles. Navigation is likewise practicable, beyond Lewiston, for 15 miles on the Clearwater, and for 42 miles on the Snake.

Low-water navigation on the river reaches named is difficult on account of numerous rapids, made by rock obstructions. The government has entered upon projects to give a 5.5 foot channel from Celilo to the Snake, 4.5 feet on the Snake to Lewiston, and 4 feet, for 40 miles from Lewiston, on the Clearwater; $200,000 have been appropriated, and $86,424 are estimated for completion of the projects.

Steamboats on the Upper Columbia and Snake are smaller than those on the middle river, but equally well appointed; the average tonnage of the former is 626 (measurement). There has been no regular barge navigation on the upper river; limited scow towing was lately introduced for carrying stone down the worst part of the navigable Snake to Ainsworth, and has proven so advantageous that doubtless grain will be transported in a similar way this fall. Larger steamers and barges could be used during medium stages; but from the isolation of the route only boats have been constructed for its trade which could profitably navigate the rivers during the busy season of low-water.

As on the middle river, the construction of the railroad on the south bank has much decreased the traffic by boat and portage. The fleet of the rail and navigation company is now used for places not reached by the railroad.

The average annual ice blockade on the upper river lasts about six weeks. Prevailing high winds occasionally increase to gales and impede navigation.

On the whole river different stages of water occur with regularity; low-water follows the harvest season with certainty; mean low stage is reached about the first of October; a freeze-up during the holidays; freshets giving good boating stages in late winter or early spring, and high-water at summer solstice. Mean low to medium stage is the easiest for navigation.

PROJECT FOR IMPROVEMENT FROM CELILO TO THE DALLES.

This improvement should be arranged for use during the same periods as that at the Cascades. These two works of magnitude and importance are only 50 miles apart and both are between the principal producing region and ship navigation; each one is the natural complement of the other, and especially is it true that navigation at the Dalles, with the Cascades closed, would be of little value.

The Cascade stage of river of 20 feet, which marks the limit of ex-

pected navigation there for present time, corresponds on the Dalles gauges—

At No. 1, to a reference of 97.5, or local stage of 8.0 feet.
At No. 2, to a reference of 74.9, or local stage of 32.7 feet.
At No. 3, to a reference of 62.6, or local stage of 42.1 feet.
At No. 4, to a reference of 32.7, or local stage of 23.4 feet.
At No. 5, to a reference of 25.0, or local stage of 17.0 feet.

Referring now to the adaptability of the localities for different kinds of improvement, it may be stated that open river navigation from good water at the lower end of the obstructed reach to the foot of the Dalles Rapids and of the rapid reaches between the Dalles and the falls may all be made entirely practicable. The Dalles Rapids are also susceptible of similar improvement during *lower* stages; but the point on a rising river, to which it can be judiciously carried, is problematic; it is not even certain that navigation through the rapid can be made practicable up to the Cascade stage of 20 feet; moreover, extensive river improvement at this locality may increase the work at rapids above. For the passage of Celilo Falls lockage will be required for all stages below mean high-water, and radical improvement below the falls will doubtless make such lockage necessary for higher stages.

The following plans have been considered:

1. To carry the Celilo level by a trunk or canal, with a lock at the upper end, to a flight of locks located near gauge station 4.

2. With lift locks as in plan 1, to dam the river, making the overfall into Big Eddy.

3. Open river improvement for all stages to Celilo Falls, and lockage for the same at the falls.

4. Open river improvement for lower stages to Celilo Falls; lockage from low to mean high-water at the falls; open passage over the falls for higher stages, and lockage from medium to highest stage at the Dalles Rapids.

The trunk or canal of plan 1 would need to be water-tight at its bottom, and on the sides to low-water line. The maximum total lift would be 81.1 feet. To give 8 feet draught and exclude high river the outer wall of the canal would be from 28 to 38 feet high. The lock on a level could be conveniently placed south of guage station 2; the Oregon chute of Celilo Falls could be made part of the canal.

There is one peculiarity of this locality which merits consideration in connection with the long canal plan, and that is the extensive movements of sand on the river sides. Between gauge stations 2 and 3, railroad gangs work uninterruptedly to keep the track free of sand. This part of the road has been in use several years, and no remedy has been found to make daily sand work unnecessary. A little beyond Celilo, sand blockades on the railroad have actually occurred.

Plan 2 would raise the flood line and cause an expensive elevation of the railroad track, unless the dam were a low one and part of the lift made at the falls.

Plans 3 and 4 are of about equal cost, and possess the advantage over the others of more open navigation instead of lockage; and the advantages of prime importance in providing navigation for the busy boating season in the least time, and furnishing benefits quickly available for each annual appropriation. Plan 3 has these merits in the greater degree, and when the injudiciousness of continuation on that plan has been practically demonstrated, a change to plan 4 may be made without loss. Open river improvement to the falls and the Celilo Canal are therefore recommended. In connection therewith a free wagon road from

Big Eddy to good water of Celilo has been estimated for. The river work should begin at the lower end, and as it advances the wagon road shortened; and when boats are able to reach the foot of the proposed canal, the road be replaced by a rail portage, or the latter structure added on the Oregon side.

A similar free portage railroad is included in the Cascade project; its length would be 3,000 feet. The length of the Dalles wagon road would be 9.6 miles; and the part around the Celilo Falls, 7,000 feet. The aggregate length of rail portages would be less than 2 miles. Their free use for the present, and until the opening of the Cascade and Celilo canals, would be of immense value to the whole Columbia River country, and an actual saving to the canal appropriations, from reduced transportation and convenient delivery of material.

The open river work of the low-water project consists in the removal of projecting points and isolated knobs of rock at the rapids. Prices given in the estimates are much less than those for which rock work has been done on the upper rivers, but are yet believed to be liberal, on account of the quantity of work required and other favorable circumstances. The places of rock removal are shown by colored areas on the maps herewith.

The extension of river improvement for open navigation of the high-water system contemplates rock removal down to or near, but not below, low-water; closing of channel on left bank opposite Three-Mile Rapids, and building of four submerged dams below that rapid. The work is calculated to give areas of least cross-section.

	Square feet.
At low-water of	6,800
At Cascade stage of 20 feet of	45,240
At mean high-water	75,360

And is expected to make a nearly continuous slope from Celilo Falls to next below, the Dalles, not exceeding 0.85 foot per 1,000 feet at the stage of greatest slope.

The location of the Dalles Canal, which is the substitute of the high-water open river improvement, is on the south side of the Dalles Rapids, as shown on the Celilo-Dalles map No. 2.

The location of the Celilo Canal is chosen on the rock plateau, flanking the falls on the Washington side. The total length of canal is nearly 3,640 feet, and of the approaches, 1,200 feet. The width between vertical sides of canal prism is 90 feet; the gate span is 70 feet and the lock chamber 90 feet by 462 feet. These dimensions are the same as in the Cascades Canal, and are intended for the admittance of a medium-sized side-wheeler and lockage of a fleet of tow-boat and three barges. The least draught is 6 feet instead of 8 feet, as at the Cascades. Six feet through the canal is certainly as great a navigable depth, for stern-wheel boats, as 7 feet at the rapids; it allows ample margin for additional depth on the upper river over that contemplated by present project. The plan provides a high guard-gate at the head and a guard-gate at the foot of the canal. The high guard-gate can subsequently be made the upper gate of a guard-lock for use as a lift-lock in the high-water system. Room is left for this addition and for an intended enlargement of the canal prism. These two changes are shown in broken lines on the plan of the canal as drawn on the Celilo Falls map. A dry-dock would be very advantageous; one to be located north of the lower part of the-guard lock is included in the estimates. Two locks, combined, are provided in the low-water system; the lifts are 23.6 and 24.6 feet; this division results from a discussion herewith.

Detailed estimates of cost are attached. Estimates in the aggregate, according to desirable stages of construction, are as follows:

SUMMARY, LOW-WATER PROJECT.

(1.)

(*a*) Title to land and right of way for river improvement and Celilo Canal	$10,000 00	
(*b*) Improvement up to Big Eddy	252,300 00	
(*c*) Wagon road and bridge	21,053 61	
		$283,353 61

(2.)

(*a*) Improvement at Five-Mile Rapids	3,382,190 00	
(*b*) Improvement at Ten-Mile Rapids	1,001,700 00	
(*c*) Improvement at Ten-Mile Rapids (relief channel)	112,680 00	
		4,496,570 00

(3.)

Celilo Canal	2,894,571 90
Total	7,674,495 51

SUMMARY OF ESTIMATE, HIGH-WATER PROJECT.

(1.)

Open river improvement below Celilo Falls	$2,272,321 00

(2.)

Celilo Canal.

(*a*) Enlargement of canal	$17,400 00	
(*b*) Guard-lock	407,800 00	
(*c*) Dry-dock	145,327 20	
		570,527 20
Total		2,842,848 20

The first stage in the low-water project gives navigation to the foot of the Dalles Rapids and the wagon road from there to head of the Falls; the second gives navigation to the Falls, and the third to Celilo. For judicious work and advantageous results the appropriation should not be less, for the first year, than the cost of the first stage; $1,000,000 each year thereafter until the river improvement is completed, and then $500,000 annually for the canal; this would require about eleven years for the completion of the project.

COMMERCIAL STATISTICS.

The Columbia is the great river of the Pacific coast. In volume and commercial value, it is second only to the Mississippi. Its banks are more stable, its waters are more clear, its ice blockades are much less in duration than on the great water-way of the East. Unlike the Mississippi, the Columbia seeks the ocean on a line parallel to trade channels, and not at right angles to them.

The drainage area of the Columbia River, above the Dalles, is estimated at 182,000 square miles; it comprises Eastern Oregon and Washington, Idaho, part of Montana, and a portion of British Columbia. The natural outlet to the seaboard for the productions of this region is by

the river. With isolated reaches of navigation and corporation portages, traffic will be by railroads, difficult in construction and expensive in maintenance, with consequent high rates of transportation.

The following table was carefully compiled from daily reports of receipts on file at the Portland Merchants' Exchange. A small part of the freight, not exceeding 15 percentage at the most, was received at landings below the Dalles Rapids, and consequently should not be credited to the upper country. The stated increase of the last year over the preceding one is in excess of the actual increase; the principal item of this difference is 15,000 tons of wheat, which the transportation first available could not promptly carry away. The amount of up freight is not known; it is considerably less than the down freight.

Columbia River traffic transported to Portland by Dalles and Cascade route of Oregon Railway and Navigation Company.

Articles.	June, 1880, to May, 1881, inclusive.	June, 1881, to May, 1882, inclusive.	Price.	Value, 1880–'81.	Value, 1881–'82.	Increase in quantity.
Wheat.....cwt.	397,113	2,019,390	$1 50	$595,669 50	$3,029,085 00	1,622,277
Flour.....bbls.	98,657	202,204	4 50	443,956 50	909,918 00	103,547
Oats.....cwt.	75	3,074	1 33	99 75	4,085 42	2,999
Barley.....do..	.....	39,147	1 50	.....	58,720 50	39,147
Mill feed.....sks	62	3,474	65	40 30	2,258 10	3,412
Potatoes.....do..	37	16,689	1 08	39 96	18,024 12	16,652
Wool.....lbs.	5,336,516	6,309,918	20	1,067,305 20	1,261,983 60	973,402
Hides.....do..	1,030,445	1,047,221	15	154,566 75	157,083 15	16,776
Cattle.....head	1,187	5,413	40 00	47,480 00	216,520 00	4,226
Sheep.....do..	4,405	9,356	3 00	13,215 00	28,068 00	4,951
Butter.....cases.	17	186	20 00	340 00	3,720 00	169
Eggs.....do..	21	50	10 00	210 00	500 00	29
Fruit.....bxs	274	7,119	8 00	2,192 00	56,952 00	6,845
Corn.....sks.	.....	481	2 00	.....	962 00	481
Flax.....do..	32,974	81,552	2 92	96,284 08	258,131 84	48,578
Bacon.....pkgs.	7	38	60 00	420 00	2,280 00	31
Chickens.....bxs.	4	7	5 00	20 00	35 00	3
Seeds.....sks	91	45	5 00	455 00	225 00	.....
Pelts.....pkgs	5,762	226	2 00	11,524 00	452 00	.....
Horses.....head.	.....	92	75 00	.....	7,100 00	92
Lime.....bbls	186	.....	1 50	279 00	.....	.....
Fur.....pks	78	.....	50 00	3,900 00	.....	.....
Salmon.....cases.	4,100	.....	5 00	20,500 00	.....	.....
Hops.....bales.	748	.....	4 00	2,992 00	.....	.....
Vegetables.....crates.	96	.....	5 00	480 00	.....	.....
Hogs.....head	80	.....	30 00	2,400 00	.....	.....
Tallow.....pkgs.	197	.....	20 00	3,940 00	.....	.....
Lard.....can.	1	.....	20 00	20 00	.....	.....
Totals.....	.....	.....	.....	2,468,278 68	6,017,103 73	.....
Increase for year ending May 31, 1882.....	.....	.....	.....	.....	3,548,825 05	.....

The population by the census of 1880, of counties which furnished the above corrected amount of freight, is 66,000.

The principal settlements are in the regions between the Blue Mountains and the rivers Snake, Columbia, and Umatilla; and next north of the middle part of the Lower Snake.

During the last year immigration largely increased. Notwithstanding the expense and tediousness of the trip *via* San Francisco and the sea, steamships arriving here each four days have of late been bringing three hundred to four hundred settlers on their way to the Upper Columbia country. Direct railroad connection with the East promises to start an unprecedented tide of immigration.

EXTENSION OF NAVIGATION BEYOND PRESENT ROUTES.

It is the announced policy of the Oregon Railway and Navigation Company to run boats on the Clearwater, Middle Snake, and the Columbia above Priest Rapids, as soon as regions along those parts of the rivers become settled. Boats have already made trips, at favorable stages, 25 miles up the Clearwater. During the Bannock war, troops were carried by steamers to the mouth of the Grande Ronde, 42 miles up the Snake from Lewiston, and previously a steamer had ascended 54 miles further. An estimate for improvement of the Snake from Lewiston to the Salmon River, 60 miles, based on an examination made last August, is $32,604.

On the main river Priest Rapids offers a serious obstacle to continued navigation. It is known, however, with fair certainty, that this obstruction and a reach of river above, together of 153 miles, are susceptible of improvement for navigation without canal or lock. This part of the Columbia will give an easy outlet for the splendid valleys of the Upper Yakima, Kittitas, Wenatchie, and Okinakane, the timbered land of Lake Chelan and that part of the great plains of the Columbia lying west of the Badger Mountains and the Grand Coulé; shipments from these regions are now almost nothing. Further north there are 430 miles of water to the head of navigation, broken only at two places, where permanent portages may be preferable to canals. Improvements for continuance of navigation beyond the present head on the Columbia, to limits indicated above, will require $500,000, according to rough estimates.

There are transmitted herewith—

Map tracings, Celilo to the Dalles, in two sheets, scale 1:6000.
One tracing Celilo Falls, scale 1:1200.
One tracing Dalles Rapids, scale 1:1200.
One set of plots of curves of corresponding readings at gauge stations.
One set of tables of corresponding gauge readings.
Profile sheet of water surfaces.
Profile of proposed wagon road.
Profile on center line of Celilo Canal.
One set of velocity tables.
A paper, notes on arrangement of lift, Celilo locks.
One set of detailed estimates, low-water and high-water improvement, Celilo to the Dalles.

Very respectfully, your obedient servant,

CHAS. F. POWELL,
Captain of Engineers.

The CHIEF OF ENGINEERS, U. S. A.

CORRESPONDING ELEVATION OF RIVER SURFACE AT GAUGES 1 TO 5.

Dalles gauges.

Gauge 1.	Gauge 2.	Gauge 3.	Gauge 4.	Gauge 5.	Remarks.
117.74	114.5	107.5	75.9	61.2	Extreme high water, 1876.
117.00	113.5	106.6	74.7	60.2	**Deduced.**
116.00	112.1	105.4	73.0	58.7	**Do.**
115.00	110.7	104.2	71.3	57.2	**Observed.**
114.00	109.3	103.1	69.6	55.8	**Do.**
113.00	107.9	101.9	67.9	54.3	**Do.**
112.00	106.5	100.5	66.2	52.8	**Do.**
111.00	105.1	99.1	64.5	51.3	**Do.**
110.00	103.7	97.6	62.8	49.8	**Do.**
109.00	102.3	95.9	61.0	48.1	**Do.**
108.00	100.9	94.2	59.2	45.3	**Do.**
107.5*	----------	----------	----------	----------	***Mean high-water.**
107.00	99.4	92.3	57.4	44.5	**Observed.**
106.00	97.7	90.2	55.6	42.6	**Do.**
105.00	96.1	88.0	53.6	40.6	**Do.**
104.00	94.3	85.6	51.4	38.6	**Do.**
103.00	92.2	83.2	49.1	36.6	**Do.**
102.00	89.9	80.6	46.5	34.5	**Do.**
101.00	87.3	77.7	43.7	32.4	**Do.**
100.00	84.3	74.4	40.7	30.2	**Do.**
99.00	81.0	70.4	37.6	28.1	**Do.**
98.00	77.2	65.3	34.3	26.1	**Do.**
97.5	**74.9**	**62.6**	**32.7**	**25.0**	**20 foot stage on Cascade gauge 2.**
97.00	72.7	59.7	31.0	24.1	**Observed.**
96.00	67.6	54.1	27.8	22.0	**Do.**
95.00	62.0	48.4	24.7	19.9	**Do.**
94.00	57.0	42.4	21.4	17.6	**Do.**
93.00	52.8	36.1	18.1	15.1	**Do.**
92.00	49.5	30.5	15.2	12.9	**Do.**
91.00	46.6	26.1	12.8	10.9	**Do.**
90.00	43.7	22.4	10.5	9.0	**Deduced.**
89.45	42.19	20.49	9.30	8.01	Extreme low-water (**deduced**).

5.000′ 11.000′ 43.000′ 51.200′ 72.000′ from railroad incline at Celilo.

6.000′ 32.000′ 8.200′ 20.800′

Foot of Three-Mile Rapid 61.200 feet from railroad incline at Celilo.

	Low-water.	20 feet on Cascade gauge No. 2.	Mean high-water.	High-water.
Foot of Three-Mile Rapid	8.7	26.8	47.75	64.25
Gauge 5	8.0	25.0	45.75	61.25
	.7	1.8	2.0	3.0

Differences of corresponding readings.

Gauge No. 1.	Gauge No. 2.	Difference.
117. 74	114. 5	3. 24
117.	113. 5	3. 5
116.	112. 1	3. 9
115.	110. 7	4. 3
114.	109. 3	4. 7
113.	107. 9	5 1
112.	106. 5	5. 5
111.	105. 1	5. 9
110.	103. 7	6. 3
109.	102. 3	6. 7
108.	100. 9	7. 1
107.	99. 4	7. 6
106.	97. 7	8. 3
105.	96. 1	8. 9
104.	94. 3	9. 7
103.	92. 2	10. 8
102.	89. 9	12. 1
101.	87. 3	13. 7
100.	84. 3	15. 7
99.	81. 0	18. 0
98.	77. 2	20. 8
97.5	**74.9**	**22.6**
97.	72. 7	24. 3
96.	67. 6	28. 4
95.	62. 0	33. 0
94.	57. 0	37. 0
93.	52. 8	40. 2
92.	49. 5	42. 5
91.	46. 6	44. 4
90.	43. 7	46. 3
89. 45	42. 19	47. 26

Differences of corresponding readings.

Gauge No. 2.	Gauge No. 3.	Difference.
114. 5	107. 5	7.
113. 5	106. 6	6. 9
112. 1	105. 4	6. 7
110. 7	104. 2	6. 5
109. 3	103. 1	6. 2
107. 9	101. 9	6.
106. 5	100. 5	6.
105. 1	99 1	6.
103. 7	97. 6	6. 1
102. 3	95. 9	6. 4
100. 9	94. 2	6. 7
99. 4	92. 3	7. 1
97. 7	90. 2	7. 5
96. 1	88. 0	8. 1
94. 3	85. 6	8. 7
92. 2	83. 2	9.
89. 9	80. 6	9. 3
87. 3	77. 7	9. 6
84. 3	74. 4	9. 9
81. 0	70. 4	10. 6
77. 2	65. 3	11. 9
74.9	**62.6**	**12.3**
72. 7	59. 7	13.
67. 6	54. 1	13. 5
62. 0	48. 4	13. 6
57. 0	42. 4	14. 6
52. 8	36. 1	16. 7
49. 5	30. 5	19.
46. 6	26. 1	20. 5
43. 7	22. 4	21. 3
42. 19	20. 49	21. 70

Differences of corresponding readings.

Gauge No. 2.	Gauge No. 4.	Difference.
114.5	75.9	38.6
113.5	74.7	38.8
112.1	73.0	39.1
110.7	71.3	39.4
109.3	69.6	39.7
107.9	67.9	40.0
106.5	66.2	40.3
105.1	64.5	40.6
103.7	62.8	40.9
102.3	61.0	41.3
100.9	59.2	41.7
99.4	57.4	42.0
97.7	55.6	42.1
96.1	53.6	42.5
94.3	51.4	42.9
92.2	49.1	43.1
89.9	46.5	43.4
87.3	43.7	43.6
84.3	40.7	43.6
81.0	37.6	43.4
77.2	34.3	42.9
74.9	**32.7**	**42.2**
72.7	31.0	41.7
67.6	27.8	39.8
62.0	24.7	37.3
57.0	21.4	35.6
52.8	18.1	34.7
49.5	15.2	34.3
46.6	12.8	33.8
43.7	10.5	33.2
42.19	9.30	32.89

Differences of corresponding readings.

Gauge No. 2.	Gauge No. 5.	Difference.
114.5	61.2	53.3
113 5	60.2	53.3
112.1	58.7	53.4
110.7	57.2	53.4
109.3	55.8	53.5
107.9	54.3	53.6
106.5	52.8	53.7
105.1	51.3	53.8
103.7	49.8	53.9
102.3	48.1	54.2
100.9	45.3	55.6
99.4	44.5	54 9
97.7	42.6	55.1
96.1	40.6	55.5
94.3	38.6	55.7
92.2	36.6	55.6
89.9	34.5	55.4
87.3	32.4	54.9
84.4	30.2	54.1
81.0	28.1	52.9
77.2	26.1	51.1
74.9	**25.0**	**49.9**
72.7	24.1	48.6
67.6	22.0	45.6
62.0	19.9	42.1
57.0	17.6	39.4
52.8	15.1	37.7
49.5	12.9	36.6
46.6	10.9	35.7
43.7	9.0	34.7
42.19	8.01	34.18

Differences of corresponding readings.

Gauge No. 3.	Gauge No. 4.	Difference.
107. 5	75. 9	31. 6
106. 6	74. 7	31. 9
105. 4	73. 0	32. 4
104. 2	71. 3	32. 9
103. 1	69. 6	33. 5
101. 9	67. 9	34. 0
100. 5	66. 2	34. 3
99. 1	64. 5	34. 6
97. 6	62. 8	34. 8
95. 9	61. 0	34. 9
94. 2	59. 2	35. 0
92. 3	57. 4	34. 9
90. 2	55. 6	34. 6
88. 0	53. 6	34. 4
85. 6	51. 4	34. 2
83. 2	49. 1	34. 1
80. 6	46. 5	34. 1
77. 7	43. 7	34. 0
74. 4	40. 7	33. 7
70. 4	37. 6	32. 8
65. 3	34. 3	31. 0
62.6	**32.7**	**29.9**
59. 7	31. 0	28. 7
54. 1	27. 8	26. 3
48. 4	24. 7	23. 7
42. 4	21. 4	21. 0
36. 1	18. 1	18. 0
30. 5	15. 2	15. 3
26. 1	12. 8	13. 3
22. 4	10. 5	11. 9
20. 49	9. 30	11. 19

Differences of corresponding readings.

Gauge No. 4.	Gauge No. 5.	Difference.
75. 9	61. 2	14. 7
74. 7	60. 2	14. 5
73. 0	58. 7	14. 3
71. 3	57. 2	14. 1
69. 6	55. 8	13. 8
67. 9	54. 3	13. 6
66. 2	52. 8	13. 4
64. 5	51. 3	13. 2
62. 8	49. 8	13. 0
61. 0	48. 1	12. 9
59. 2	45. 3	13. 9
57. 4	44. 5	12. 9
55. 6	42. 6	13. 0
53. 6	40. 6	13. 0
51. 4	38. 6	12. 8
49. 1	36. 6	12. 5
46. 5	34. 5	12. 0
43. 7	32. 4	11. 3
40. 7	30. 2	10. 5
37. 6	28. 1	9. 5
34. 3	26. 1	8. 2
32.7	**25.0**	**7.7**
31. 0	24. 1	6. 9
27. 8	22. 0	5. 8
24. 7	19. 9	4. 8
21. 4	17. 6	3. 8
18. 1	15. 1	3. 0
15. 2	12. 9	2. 3
12. 8	10. 9	1. 9
10. 05	9. 0	1. 5
9. 30	8. 01	1. 29

SURVEY OF THE DALLES, COLUMBIA RIVER, 1879–1880.

Current measurements.

Place.	Date.	Stage of river above low-water.	Surface velocity, in miles per hour.	Remarks.
		On gauge 5.		
Above Celilo Falls	Oct. 22, 1879	5.2	1.2	
			1.9	
			2.2	Maximum.
			1.8	Mean.
Near △ 4 L	June 17, 1880	41.6	11.4	Maximum.
			10.0	
			6.6	
			7.5	
			8.9	Mean.
Opposite △ 6 L—△ 7 L	Oct. 22, 1879	5.2	5.4	
			6.2	Maximum.
			5.8	Mean.
Opposite △ 8 L	Oct. 25, 1879	5.4	7.0	Maximum.
			6.9	
			6.95	Mean.
Near △ 8 L	June 17, 1880	41.6	5.2	
			5.1	
			5.7	
			5.9	Maximum.
			5.5	Mean.
Opposite △ 10 R	Oct. 25, 1879	5.4	5.3	
			5.6	
			5.8	Maximum.
			5.6	Mean.
Ten-Mile Rapid, opposite △ 17 L	Nov. 10, 1879	4.4	7.8	
			7.2	
			7.8	Maximum.
			7.6	Mean.
High-water channel, opposite Ten-Mile Rapid.	June 18, 1880	42.4	7.6	
			7.8	
			7.0	
			6.7	
			8.3	Maximum.
			7.5	Mean.
Opposite △ 20 L	Nov. 11, 1879	4.5	4.3	
			6.6	
			12.7	Maximum.
			7.9	Mean.
Near △ 29 R	June 18, 1880	42.4	5.6	
			5.7	Maximum.
			5.6	
			5.1	
			5.5	Mean.
Above Five-Mile Rapid, opposite △ 31 L	Jan. 9, 1880	4.7	3.7	Maximum.
			2.8	
			3.2	Mean.

Current measurements—Continued.

Place.	Date.	Stage of river above low-water.	Surface velocity, in miles per hour.	Remarks.
		On gauge 5.		
Near △ 32 L	June 21, 1880	43.8	16.7	
			12.5	
			13.6	
			7.5	
			15.0	
			13.6	
			18.8	Maximum.
			14.0	Mean.
Near △ 33 L	June 16, 1880	40.3	15.1	
			14.2	
			10.4	
			12.0	
			11.4	
			15.5	Maximum.
			13.1	Mean.
Five-Mile Rapid, opposite △ 1 C	Jan. 9, 1880	4.7	6.4	Maximum.
			6.2	
			6.3	Mean.
Opposite △ 41 L	June 16, 1880	40.3	7.6	Maximum.
			7.6	
			7.1	
			5.9	
			7.0	Mean.
Opposite △ 44 L	Jan. 11, 1880	4.2	1.7	
			2.1	Maximum.
			1.9	
			1.9	Mean.
Opposite △ 45 L	June 16, 1880	40.3	13.4	Maximum.
			11.8	
			12.7	
			13.0	
			10.5	
			12.7	
			12.3	Mean.
Narrows, opposite △ 49 R	Jan. 11, 1880	4.2	2.1	
			3.0	Maximum.
			2.8	
			2.9	
			2.7	Mean.

NOTES ON ARRANGEMENT OF LIFT FOR CELILO LOCKS.

River improvement below the Falls will lower low-water surface. A decrease of one foot is assumed. This will make the new low-water reference at gauge 2, 41.2. A single lock for use during the Cascade stage of 20 feet would require a lower gate at least 60 feet high. With a single lift, for continued navigation beyond the Cascade stage of 20 feet, double lockage would be required until the backwater is 6 and preferably 8 feet on the upper level of canal; this would require for convenience a height of lower gate of about 68 feet. The gates must be about 42 feet wide. Pressures resulting from the heads of water which obtain are excessive. Moreover, the Cascades work so far render practicability of navigation probable for stages higher than the 20-foot one.

The addition of a lock after the canal is opened will cause some interruption or delay to navigation. Two locks at Celilo seem desirable for the first stage of construction.

TO FIND THE BEST ARRANGEMENT OF THE LIFT.

At extreme low stage the equalization of water surfaces in two locks during lockage will be, $\frac{1}{2}$ (89.4 + 41.2) = 65.3. To give 6 feet draught at this level the sill at middle gate must then not exceed reference 59.3

Take now the same measure for maximum total pressure permissible on a gate as adopted at the Cascades Canal. This limit is expressed by the formula $P_m = 1369\,c$, wherein c is a constant depending upon gate span and rise of miter sill, which are chosen the same for the two canals. An inspection of the curve of corresponding readings on gauges 1 and 2 shows that for stages between readings of 55 and 75, gauge 2, the rise on that guage for 1 foot on guage 1 is uniform and equal to 5 feet.

From the ordinary hydrostatic formula we may write, $P = c\,(H^2 - H_1^2) = c\,(H+H_1)\,(H-H_1)$, in which P is total intensity and $H+H_1$ are heads of water respectively on upper and lower sides of gate. Referring these heads to the nth stage between the limits named, the formula becomes for the n +1 foot stage on guage 1, $\frac{P}{c} = (H + H_1 + 6)\,(H - H_1 - 4) = H^2 - H_{12} + 2\,[H - (5\,H_1 + 12)]$. From the last member we deduce that the total intensity at any stage will be greater or less than at the preceding stage of 1 foot on guage 1 according as $H > 5\,H_1 + 12$ or $H < 5\,H_1 + 12$; and that the maximum value will obtain when $H = 5\,H_1 + 12$. For the bottom of middle gate between references 59 and 50 and readings on gauge 2 greater than 75 and less than 55 it may be shown that gate pressures are less than between those stages. From the expressions of condition above and the adopted limit of pressure, the middle miter sill is fixed as shown on the profile. Heights of gates are selected from similar considerations, to give lockage by two locks from low to near mean high-water and to have two sizes only of gates throughout the canal. Low guard-sills are placed in front of gates which are at the ends of long reaches of water.

A change of regimen of the river at the falls by radical improvement below may make a little different arrangement of locks desirable; the one offered is sufficient for a fairly close estimate of cost. The project provides for full completion of river improvement before commencement of canal construction.

CHAS. F. POWELL.

DETAILED ESTIMATES OF LOW-WATER PROJECT.

(1) *Wagon road from Big Eddy to head of Celilo Falls, Washington Territory.*

Road station.	Distance.	Grade.	Cut.	Fill.	Remarks.
	Feet.		*Cubic yards.*	*Cubic yards.*	
0 to 1	3,900	1 in 200			Smooth flat rock surface.
1 to 2	1,000	1 in 65	(Rock) 240		Station 2 is near Celilo Falls.
2 to 3	3,000	Level	(Rock) 200		Station 3 is near △ 9 R.
3 to 4	2,400	1 in 480			Station 4 is near △ 11 R.
4 to 5	200	1 in 40			Surface forming loose bowlders to remove.
5 to 6	250	Level	(Rock) 300	(Rock) 300	Do.
6 to 7	2,500	1 in 830			Do.
7 to △ 13 R	1,200	Level			
△ 13 R to 8	1,200	Level			Station 8 near △ 14 R; loose bowlders to remove.
8 to 9	1,300	1 in 93			Loose bowlders to remove.
9 to 10	1,700	1 in 212			Do.
10 to 11	2,000	1 in 166			Do.
11 to 12	900	1 in 300			
12 to 13	3,700	1 in 370	(Rock) 600	900	
13 to 14	1,800	1 in 82			Do.
14 to 15	1,000	Level	(Rock) 300	100	
15 to △ 26 R	5,200	Level	4,680	4,680	In side cut all the way, and will probably average 90 yards per 100 feet. Road 12 feet wide.
△ 26 R to △ 28 R	2,000	1 in 110	2,000	1,000	
△ 28 R to 16	2,600	Level	300	400	
16 to 17	1,700	1 in 85	1,500	1,500	Side cut.
17 to 18	300	1 in 60			Station 18, bridge begins.
18 to 19	450	Level		400	Bridge 300 feet.
19 to 20	2,000	Level		500	Loose bowlders to remove.
20 to 21	850	1 in 280	(Rock) 200	400	Do.
21 to 22	850	1 in 106	(Rock) 160	500	
22 to 23	600	1 in 150		200	

Detailed estimates of low-water project—Continued.

Road station.	Distance.	Grade.	Cut.	Fill.	Remarks.
			Cubic yards.	*Cubic yards.*	
23 to 24	1,200	Level			Surface forming loose bowlders to remove.
24 to 25	900	1 in 100		700	
25 to 26	100	1 in 50		300	
26 to 27	350	Level	(Rock) 200	200	
27 to 28	400	1 in 56		260	
28 to 29	300	1 in 30		1,000	
29 to 30	100	Level		900	
30 to 31	500	1 in 122		500	
31 to 32	750	Level	200	350	
32 to 33	350	1 in 60			
33 to 34	850	1 in 28	400	200	
	50,400 9.55 miles.		11,280	15,290 +1,840	⅓ gravel and earth, ⅔ rock. To borrow.
Total				17,130	

6,500 cubic yards rock, at $1.50 ..... $9,750 00
10,630 cubic yards earth and gravel, at 40 cents 4,252 00
2,200 cubic yards rock additional, wasted, at $1.50 ..... 3,300 00
10,500 linear feet, 3,500 cubic yards, dry retaining wall, at 63 cents . 2,205 00
Bridge as per detail estimate 1,546 61

Total, wagon road and bridge 21,053 61

WAGON ROAD BRIDGE, SPAN 300 FEET.

Bill of lumber.

	B. M.	B. M.
Center bents (8):		
Piles (lower), 12″ x 12″ x 50′, 600 x 4 piles	2,400	
Piles (dwarf), 12″ x 12″ x 15′, 180 x 2 piles	360	
Piles (upper), 12″ x 12″ x 25′, 300 x 3 piles	900	
Braces (lower), 8″ x 8″ x 35′, 175 x 2 braces	350	
Braces (upper), 6″ x 8″ x 30′, 120 x 2 braces	240	
Caps (lower), 12″ x 12″ x 20′, 240	240	
Caps (upper), 12″ x 12″ x 12′, 144	144	
Stringers, 6″ x 12″ x 29′, 120 x 2	240	
Stringers (upper), 6″ x 14″ x 20′, 140 x 6	840	
Flooring, 3″ x 13″ x 20′, 780	780	
Wheel-guards, 6″ x 4″ x 20′, 40 x 2	80	
Hand-rail and hub-guard, 4″ x 4″ x 40″ = 55 + 2″ x 4″ x 80′ = 52	107	
	6,677	
Bents	8	
	53,416	53,416
End bents:		
Piles, 12″ x 12″ x 30′, 360 x 3 piles	1,080	
Cap, 12″ x 12″ x 12′, 144	144	
Braces, 6″ x 8″ x 20′, 80 x 2	160	
Stringers, 6″ x 14″ x 20′, 140 x 6	840	
Flooring and rails as above, 970	970	
	3,194	
Bents	7	
	22,358	22,358
		75,774
At $15 per M		15
		$1,136 61
Bolts and nuts, 1,100 pounds, at 10 cents $110 Labor 300		410 00
		1,546 61

(2.) *Channel improvement from foot of Three-Mile Rapids to Celilo Falls.*

[Colored red on chart, except Cut No. 8*a*, which is yellow.]

Cut No.—		Depth to low-water.	Depth below low-water.	Length of cut.	Cubic yards above low-water.	Cubic yards below low-water.	Remarks.
Celilo–Dalles Map No. 2.	1	3.0	10.0	60	300	950	Isolated rock near △ 51 R.
	2	8.0	10.0	72	830	1,100	Isolated rock near △ 50 R.
	3	.....	10.0	130	.....	900	Submerged rock.
	4	4.0	10.0	.....	370	3,900	Rock and reef.
	5	10.0	10.0	300	4,800	5,000	Portion of island opposite M.
	6	14.0	10.0	250	6,500	4,600	Point of rock at M.
	7	14.0	10.0	200	4,600	2,800	Island opposite △ 45 L.
	8	16.0	10.0	100	2,400	1,700	Point near △ 45 L.
The Dalles Map.	8*a*	3.0	0.0	150	1,600	.....	Narrow channel near △ 43 R.
	9	40.0	10.0	260	10,800	6,000	Island near Grave Island.
	9*a*	20.0	10.0	250	3,400	5,555	Near △ 40 R.
	10	16.0	10.0	23	300	180	Island near Grave Island.
	11	19.0	10.0	130	1,700	1,300	Do.
	11*a*	6.0	10.0	100	650	500	Point on Grave Island.
	12	5.0	10.0	120	570	1,100	Island near △ 5 C.
	12*a*	15.0	10.0	200	6,860	4,574	Point near △ 39 R.
	13	8.0	10.0	50	450	560	Island near △ 5 C.
	14	40.0	10.0	470	14,300	7,100	Near △ 38 R.
	15	46 0	10.0	280	4,100	3,200	Island near △ 38 R (south side).
	16	17.0	10.0	100	1,620	500	Near △ 38 R.
	17	25.0	10.0	600	8,300	5,400	Near △ 37 R.
	18	20.0	10.0	550	7,050	4,100	Near △ 3 C.
	19	30.0	10.0	1,150	54,000	27,000	Near △ 1 C.
	20	34.0	10.0	700	17,400	9,200	Near △ 35 R.
	21	31.0	10.0	230	1,200	880	North side of channel, opposite Cut No. 22.
Celilo–Dalles Map No. 2.	22	31.0	10.0	600	48,000	23,900	Near △ 1 C.
	23	33.0	10.0	280	2,800	2,300	Below head of Relief Channel.
	24	30.0	10.0	600	10,600	6,500	Above head of Relief Channel.
	25	35.0	10.0	470	9,100	4,200	Above △ 34 L on south side.
	26	55.0	10.0	500	28,300	9,400	Opposite section house, north side.
	27	47.0	10.0	460	31,200	12,650	Do.

Ten-Mile Rapids.

[Colored red on chart.]

Celilo–Dalles Map No. 1.	28	10.0	10.0	300	4,600	6,400	Near △ 26 R.
	29	10.0	10.0	250	13,500	13,200	Do.
	30	20.0	10.0	600	14,000	8,300	Island near △ 26 R.
	31	8.0	10.0	100	1,400	2,200	Isolated rocks.
	32	7.0	10.0	100	900	1,200	Island near △ 25 R. (north end).
	33	51.0	10.0	150	6,800	1,500	Near △ 18 R.
	34	32.0	10.0	700	14,800	7,200	Near △ 17 L. (south side).
	35	33.0	10.0	150	1,400	890	Near △ 17 R. (north side).
	36	33.0	10.0	400	3,200	3,000	Near △ 17 L. (south side).
	37	30.0	10.0	600	63,800	31,400	Near △ 16 R.
					408,500	232,339	

(3.) *Enlargement of side channel near head of Dalles Rapids, Washington Territory shore.*

[Colored red on chart.]

Station number.	Width, feet.	Depth to low-water, maximum.	Depth below low-water.	Cut to low-water.	Cut below low-water.	Remarks.
		Feet.	*Feet.*			
1	100	50	10	19,800	4,100	Entrance to channel (low-water 20 feet).
				8,600	7,500	Entrance to channel (north side).
2	100	30	10	7,200	2,400	
3	100	45	10	2,700	840	
4	100	40	10	13,900	5,000	
5	100	50	10	8,700	3,200	
6	100	50	10	47,000	10,300	
7	100	50	10	20,100	4,800	(Low-water 18 feet.)
8	120	50	10	24,000	7,000	
9	120	44	10	16,500	7,500	
10	120	44	10	9,800	4,800	
11	120	50	10	12,500	3,700	
12	130	57	10	24,200	5,200	
13	120	48	10	15,000	3,300	
14	100	45	10	10,000	3,100	(Low-water 15 feet.)
15	.....	40	10	9,100	6,800	Re-enter river near △ 34 R
				249,100	79,540	
Brought forward				408,500	232,339	
Total excavation				657,600	311,879	

657,600 cubic yards excavated down to low water, at $2	$1,315,200
311,879 cubic yards excavated below low water, at $10	3,118,790
Total	4,433,990

(4) *Enlargement of side channel near middle of Dallas Rapids, Oregon shore, to give 8 feet depth at stage of 20 feet on Cascade Gauge No. 2.*

[Colored yellow on chart.]

Station.	Depth of water.	Width of channel.	Cut.	Remarks.
	Feet.	*Feet.*	*Cub. yds.*	
0 to 400	8	100	8,300	
400 to 550	8	100	5,200	
550 to 850	8	100	4,700	
850 to 1200	8	100	1,100	In pond to left of △ 1 c.
1200 to 1400	8	100	3,700	Do.
1400 to 1700	8	100	6,500	Do.
1700 to 1900	8	100	7,100	Do.
1900 to 2150	8	100	10,500	In pond between △ 2 c and △ 4 c.
2150 to 2300	8	100	9,300	Do.
2300 to 2450	8	100	6,700	Do.
2450 to 2600	8	100	10,800	Do.
2600 to 2850	8	100	15,600	Do.
2850 to 3200	8	100	20,400	Do.
3200 to 3500	8	100	19,700	
3500 to 3700	8	100	5,200	
3700 to 4250	8	100	.....	Re-enter river.
			134,800	

134,800 cubic yards, above mean low-water, at $1.50	$202,200
Brought forward	4,433,990
	4,636,190

(5) *Enlargement of channel around Ten-Mile Rapids, Washington Territory shore, to be 300 feet wide and 8 feet deep at stage of 20 feet on Cascade Gauge No. 2.*

[Colored yellow on chart.]

Stations.	Depth of water in feet.			Width.	Cut.	Remarks.
	Left.	Center.	Right.			
					Cubic yds.	
0	30	36	30	300	.....	Extreme low-water near △ 16 R.
400	8	15	8	220	.....	Channel 300 feet wide, 6.5 feet at sides.
800	8	15	8	225	.....	Do.
1100	8	16.5	8	300	.....	Do.
1500	8	17	8	300	.....	Do.
1700	8	17	8	200	.....	Channel may be widened with light cut.
1900	8	17	8	350	.....	Head of small pond.
2400	8	20	8	500	.....	In small pond.
2800	8	14	8	300	.....	Foot of small pond.
2900	6.5	14	6.5	200	.....	In smallest pond.
3100	8	14	8	250	.....	Do.
3200	8	16	10	200	**480**	Cut on left bank.
3450	8	16	8	200	**8,000**	Between smallest and long pond.
3600	8	16	8	250	**5,440**	Do.
4200	8	8	8	250	**13,200**	Do.
4400	8	8	8	250	**4,000**	At head of long pond.
5000	8	12	8	220	**18,500**	In long pond.
5400	8	12	8	220	**4,400**	Do.
5700	8	12	8	250	**800**	Do.
5800	8	12	8	250	**1,100**	Do.
6200	8	8	8	250	**7,400**	Do.
6700	8	12	8	250	**7,400**	Foot of long pond.
7000	8	12	8	250	**4,000**	Near △ 20 R.
7300	8	10	8	250	**1,000**	Do.
8800	10	10	10	300	**75,720**	Re-enter river.

75,720 cubic yards excavation of rock above mean low water, at $1.50.	$112,680 00
Amount brought forward	4,636,190 00
Wagon-road and bridge	21,053 61
Title to land and right of way for improvement and Celilo Canal	10,000 00
Total low-water project, exclusive of Celilo Canal construction	**4,779,923 61**

(6.) CELILO CANAL.

Abstract of estimate of cost.

Protective and wing walls	$348,715 08
Excavation	1,035,419 60
Masonry	1,111,460 20
Crib-work	62,977 02
Five pairs gates	86,000 00
Buildings, machinery, culverts, and other accessories	250,000 00
Total	**2,894 571 90**

(*a*) *Estimate for protective wall on river side.*

[Structure of concrete, with facing of hard finish.]

Section.	Depth.	Area.	Length.	Cubic feet.	Cubic yards.
	Feet.		*Feet.*		
No. 1	29	337	.....	.....	
2	23	253	840	247,800	
3	22.7	249	360	90,360	
4	32.6	394.5	50	16,090	
5	17.6	179	170	48,739	
6	15.2	150	180	29,610	
7	17.0	172	130	6,430	
8	41.6	549	510	183,555	
9	39.6	515	180	95,760	
10	45	612	100	56,356	
11	20	210	380	156,180	
12	30.2	359	410	116,645	
13	45.4	621	50	24,500	
14	24	264	60	26,550	
15	35	394	200	66,800	
16	50	710	10	5,520	
17	50	710	40	28,400	
			3,670	1,199,295	44,418

44,418 cubic yards concrete, at $7	$310,926 00
105,590 square feet of hard finish, at 4 cents	4,223 60
	315,149 60

(*b*) *Estimate for wing wall at head of canal.*

[Structure of concrete, with facing of hard finish.]

Section.	Depth.	Area.	Length.	Cubic feet.	Cubic yards.
	Feet.		*Feet.*		
No. 1	4.5	38.7	30	582	
2	14.5	142.1	120	10,848	
3	17.5	178.5	80	14,427	
4	14.5	142.1	60	9,618	
5	24.4	269.6	150	30,877	
6	29.4	343.1	200	61,270	
				127,622	4,727

4,727 cubic yards concrete, at $7	$33,089 00
11,912 square feet hard finish, at 4 cents	476 48
Brought forward	315,149 60
Total	**348,715 08**

(*c*) *Estimate of excavation.*

Designation of section.	Area.	Average depth of cut.	Cubic feet.	Cubic yards.
		Feet.		
Approach to upper guard-gate	33,040	4.2	1,387,680	.....
Masonry of upper guard-gate	1,056	10.6	12,194	.....
Do	8,260	11.1	91,686	.....
Upper level	48,560	11.0	534,160	.....
Do	18,000	12.5	225,000	.....
Do	9,000	16.0	144,000	.....
Do	18,000	13.0	234,000	.....
Do	18,000	16.0	288,000	.....
Do	31,500	24.0	756,000	.....
Do	27,000	21.5	580,500	.....
Do	29,700	14.0	415,800	.....
Do	5,600	5.0	28,000	.....
Upper lock	8,680	28.2	244,776	.....
Do	5,600	40.2	225,120	.....
Do	27,450	40.2	1,103,490	.....
Do	5,600	43.0	240,800	.....
Do	21,648	40.4	874,679	.....
Lower lock	8,162	64.0	522,368	.....
Do	8,862	64.0	567,168	.....
Do	40,980	63.5	2,602,230	.....
Do	8,862	53.0	469,686	.....
Do	8,162	53.8	439,116	.....
Lower guard-gate	7,714	53.8	415,013	.....
Do	700	52.8	36,960	.....
Below lower guard-gate	6,240	57.0	355,680	.....
Do	112,654	8.0	901,232	.....
Total, rock	.....	.....	13,695,338	507,235
GRAVEL.				
Below lower guard-gate	112,654	8.0	901,232	.....
Do	$\frac{320\times715}{2}$	=	114,400	.....
Do	$16\times8\times\frac{715}{3}$	=	30,507	.....
Do	$\frac{(20\times16)\times(16\times8)}{3}$	$\times715=$	106,749	.....
Total, gravel	.....	.....	1,152,888	42,700

460,683 cubic yards excavation of rock above low-water, at $1.20	$522,819 60
46,552 cubic yards excavation of rock below low-water, at $10	465,520 00
42,700 cubic yards excavation of gravel, at 40 cents	17,080 00
Total	**1,035,419 60**

(*d*) *Masonry.*

Section.	Cubic yards.
Upper guard-gate	4,991.7
Upper lift-gate	6,555.6
Upper lock-chamber	30,846.4
Middle lift-gate	8,260.7
Lower lock-chamber	29,620.4
Lower lift-gate	7,753.0
Lower guard-gate	5,466.0
Lift-walls	2,471.5
Total	**95,965.3**

87,987.9 cubic yards concrete, at $11	$967,867 00
7,977.4 cubic yards cut stone masonry, at $18	143,593 20
Total cost of masonry	**1,111,460 20**

(*e*) *Crib work.*

	Feet b. m.
At upper entrance on river side	331,190
At upper entrance on land side	248.040
At head of upper lock on river side	88,944
At head of upper lock on land side	79,140
At foot of canal on river side	1,227,888
At foot of canal on land side	124,032
Total	**2,099,234**

2,099,234 feet B. M., in place, crib completed, including iron, at $30 per M.	$62,977 02

(*f*) *Iron lock-gates.*

Upper guard-gates	$15,000
Upper lift-gates	15,000
Middle lift-gates	20,500
Lower lift-gates	20,500
Lower guard-gates	15,000
Total	**86,000**

II.—ESTIMATE OF HIGH-WATER PROJECT.

(1) *River work.*

For additional removal of rock down to or near, but not below, low-water, to give a continuous slope from Celilo Falls to the Dalles of not more than 0.85 foot per 1,000, at the following-named points:

	Cubic yards.
At head of Dalles (Five-Mile Rapids)	666,667
Thence through Dalles to Bigg Eddy	1,884,440
Opposite △ 42 L	71,100
Opposite △ 45 L	17,700
Opposite △ 47 L	15,400
	2,655,307
Less excavation included in low water project	868,120
	1,787,187
Submerged dam and closing minor channel at Narrows	21,500
Three submerged dams at Dalles City	35,256
	56,756
Cut through shoal above Five-Mile Rapids, 150 feet wide to 8 feet below low-water	40,000

1,787,187 cubic yards excavation, at $1	$1,787,187
56,756 cubic yards excavation, at $1.50	85,134
40,000 cubic yards excavation, at $10	400,000
	2,272,321

(2) *Celilo Canal.*

Enlargement of canal:

(*a*) 14,500 cubic yards excavation, at $1.20			$17,400 00
(*b*) Guard-lock:			
1,920 cubic yards excavation under masonry, at $10	$19,200 00		
27,700 cubic yards concrete, at $11	304,700 00		
1,050 cubic yards cut stone masonry, at $18	18,900 00		
1 pair gates	15,000 00		
Machinery, &c	50,000 00		
			407,800 00

(*c*) Dry dock 70 by 300 feet:

	Cubic yards.		
Approach in canal 900 feet long	32,667		
Chamber 300 feet long	10,889		
	43,556		
Concrete walls	8,580		
Cut stone facing	1,000		
43,556 cubic yards excavation, at $1.20		$52,267 20	
8,580 cubic yards concrete, at $7		60,060 00	
1,000 cubic yards cut stone, at $18		18,000 00	
One pair gates		15,000 00	
			$145,327 20
Total			570,527 20

47TH CONGRESS, 1st Session. } SENATE. { Ex. DOC. No. 185.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A communication from the Chief of Engineers dated June 23, 1882, and the accompanying copy of report from Maj. Amos Stickney, Corps of Engineers, upon a survey for a breakwater in Lake Pontchartrain, in the vicinity of the New Canal outlet near New Orleans.

JUNE 26, 1882.—Referred to the Committee on Commerce and ordered to be printed.

WAR DEPARTMENT,
Washington City, June 23, 1882.

The Secretary of War has the honor to transmit to the United States Senate, for the information of the Committee on Commerce, a communication from the Chief of Engineers dated to-day, and the accompanying copy of report from Maj. Amos Stickney, Corps of Engineers, upon a survey, made in compliance with provisions in the river and harbor act of March 3, 1879, for a breakwater in Lake Pontchartrain, in the vicinity of the New Canal outlet near New Orleans, to serve as a harbor of refuge.

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT *pro tempore*
of the United States Senate.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., June 23, 1882.

SIR: I have the honor to submit herewith a copy of a report to this office from Maj. Amos Stickney, Corps of Engineers, of the results of a survey made, to comply with requirements of the river and harbor act of March 3, 1879, under the direction of his predecessor, the late Maj. C. W. Howell, Corps of Engineers, for a breakwater to be constructed—

From a point at or near the New Canal outlet near New Orleans, La., to the Pontchartrain Railroad wharf, said breakwater to be so constructed as to serve as a harbor of refuge for all vessels.

Very respectfully, your obedient servant,

H. G. WRIGHT,
Chief of Engineers, Brig. and Bvt. Maj. Gen.

Hon. ROBERT T. LINCOLN,
Secretary of War.

SURVEY FOR A BREAKWATER IN LAKE PONTCHARTRAIN, IN THE VICINITY OF NEW CANAL OUTLET NEAR NEW ORLEANS, TO SERVE AS A HARBOR OF REFUGE.

UNITED STATES ENGINEER OFFICE,
New Orleans, La., June 13, 1882.

GENERAL: I have the honor to make the following report on the "survey and estimate for a breakwater to be constructed from a point at or near the New Canal outlet near New Orleans, La., to the Pontchartrain Railroad wharf, said breakwater to be so constructed as to serve as a harbor of refuge for all vessels," called for in the river and harbor act of March 3, 1879.

The survey was made by Assistant Engineer H. C. Collins in the summer of 1880, but owing to the illness of Major Howell the subject seems to have remained unconsidered.

In view of the fact that the southern shore of Lake Pontchartrain has no harbors except the mouths of the canals, into which vessels can run for refuge, I consider the construction of a breakwater a matter of very considerable importance. I do not see the necessity at present for the construction of such a long line of breakwater as seems contemplated in the act directing the survey, viz, "from a point at or near the New Canal outlet near New Orleans, La., to the Pontchartrain Railroad wharf," which is a distance of a little over 3 miles, unless the main object is to protect a narrow strip of land along the lake. If this is the object it can be effected far more economically by a revetment, which, placed on the face of a low levee, would also protect the city of New Orleans from overflows caused by the piling up of the water in the lake during strong east winds. I would recommend the construction of a breakwater in two sections, each about 4,000 feet long, placed in front of the entrances of the two canals and on a line parallel to the shore, and about 4,500 feet from it, as shown on the accompanying chart. This would be about 2,000 feet in front of the New Canal entrance and 1,500 feet in front of Bayou Saint John entrance, and in a depth of water varying from $11\frac{1}{2}$ to $12\frac{1}{2}$ feet. As 8 feet is the maximum draught of vessels navigating the lake, this position of breakwater, while covering the entrances, would give ample anchorage area for present needs, and would admit of very considerable enlargement for future wants by simply connecting the detached sections and continuing the line to the eastward. The plan of breakwater that I would recommend would be a modification of those constructed on the northern lakes, viz, timber cribs, with partly open bottoms, resting on piles and weighted with such material as could be most economically obtained in this region. Stone might possibly be had within a reasonable cost from a point about 125 miles up Pearl River; that failing, shell concrete and broken brick could be used. I think a breakwater of this description with a width of 12 feet would cost about $35 per linear foot, which for 8,000 feet would be $280,000.

To construct a continuous breakwater of similar character, from the New Canal to the Pontchartrain Railroad wharf, would cost—16,500 feet, at $35, $577,500—more than double the first amount. The plan of breakwater adopted in 1853, and upon which 1,500 feet was constructed, proved to be inefficient, the upper part of the structure being destroyed in a comparatively short time. Its position, so far out in the lake, required a considerably longer line than the one which I recommend, and

contemplated the protection of a much larger anchorage area than present needs would seem to require.

I transmit herewith Mr. Collins' report on his survey, together with a tracing of the chart; also tracing showing old plan of breakwater referred to in Mr. Collins' report; also a table showing the commerce to be benefited.

Very respectfully, your obedient servant,

AMOS STICKNEY,
Major of Engineers.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

REPORT OF MR. H. C. COLLINS, ASSISTANT ENGINEER.

NEW ORLEANS, LA., *June* 10, 1882.

SIR: Acting under instructions from Maj. C. W. Howell, United States Engineers I made a survey of the Lake Pontchartrain front of New Orleans, from the New Cana to the Pontchartrain Railroad wharf, in April, May, and June, 1880.

Soundings cover the whole lake front to a width of nearly a mile from above the old Carrollton Railroad wharf to below the Lake Pontchartrain Railroad wharf; and twelve lines of soundings were made out to the 14-foot curve at mean low-tide, which was from 2 to 3 miles off shore. Tide-gauges were placed at the New Canal and at Bayou Saint John and connected by level line with the city engineer's bench marks.

Mean low-tide, to which all soundings are reduced, is 25 feet below the city datum plane, and 5 feet below the top of Metairie Ridge.

Extreme low-tide, which is due to northwesterly gales, is said to be nearly a foot and a half below this mean low-tide. These gales only occur in winter, and it is only when they last three days or more that their full effect is seen in blowing the water out of Lake Pontchartrain, lowering the water surface along the north shore of the Gulf as far east as Mobile.

Three drainage canals from the city enter the lake within the limits of the survey, and one just east of the east line. The two navigable canals are called New Canal, which was dug by the city of New Orleans, and Bayou Saint John, which was a navigable bayou at the first settlement of New Orleans, but has been deepened in some places and extended to a basin in the city; and its entrance into the lake has been deepened and a jetty made on each side out to about the 6-foot curve in the lake. Toll is charged on vessels entering Bayou St. John by the company who claim ownership of the improvements on the bayou. Toll was charged on the New Canal, but it has been made a free channel by the city.

Soundings were made in both navigable channels up above the bridges. The water which flows from the drainage canals is very dark, at times black. There is a large amount of organic matter in this water, but there is so little deposit from it that there is no advance of any curves in front of either of the drainage canals, nor is there any indication on the bottom of any filling due to them.

Shell banks are found in long, narrow reefs, nearly parallel with the shore, but not farther out than about the 7-foot curve. There is usually about a foot less water on top of these shell reefs than there is just shoreward from them.

Sand bottom is found in many places where the depth is 10 feet or less.

Near the New Canal a bucket dredge was digging up earth for an embankment, from a place where the lake bottom had evidently not been disturbed before, and the water was 3½ feet in depth. She was cutting to a depth of 11 feet. The material dredged up was dark mud, which, when dried, proved to be nearly all very fine sand, with some vegetable matter and a little clay, but it was not such as would resist any washing of waves. When thrown up and protected by a revetment it makes a good levee. Outside of the 10-foot curve the bottom is all blue, sticky mud, with broken shells, and living shell-fish were occasionally found. When dry, this mud was almost exactly like that dredged up near shore. In places a slight film of yellow mud was found on the bottom, which was evidently deposited from the Mississippi River water, then running into the west end of the lake from Bonnet Carre Crevasse. This was so thin as only to stain the lead slightly at times, and some of it came up on the anchors to the buoys. This yellow mud is so thin that whenever the water is very rough it is taken up and held in suspension, making the water yellow when a gale had blown for a few days.

The bars which obstruct navigation at both canals are of sand, and there was but 5 feet depth at low-tide at either canal over the bar. The sand appears to drift into

the entrance of the canals during gales, and then to be thrown out on to the bar, by the current at ebb-tide, out of the canals. The entrance to the New Canal is protected by a jetty on each side, made of material dredged from the canal, and kept in place by crib work or piling, with a revetment of plank outside to protect it from the lake waves. The shore line is washing away except where protected for the whole front surveyed.

Old cypress stumps remain, forming a belt from 200 to 500 feet in width outside the present shore line. The trees were cut so long ago that the cypress knees which formerly protected the land from action of the waves have disappeared. A good road was made from the New Canal to Lake Pontchartrain wharf at Milneburg, and was in use in part as lately as 1870, but it now is seen only on a few points which project far beyond the general shore line.

The city of New Orleans made a breakwater in 1872. It was made in shoal water; about a foot deep just outside the line is its present depth, and earth for a levee was dredged from inside, and a sloping revetment of plank was first made to protect it from wash, but it soon broke down and was replaced by one made of round piles driven in a line and touching, leaving a space between the plank sheet piling and the round piles about 4 feet wide. This space was filled with brickbats and old ballast. The plan for it was made by General Weitzel.

The piling is 5 feet above low-water, and the top of the levee back of it is 2½ feet higher. This breakwater begins at the shore line at the west side of the upper drainage canal, runs out to the 1-foot curve, and then turns to eastward and runs to the west side of the New Canal. The original plan of this breakwater was for its continuation some miles along shore to a point below the Pontchartrain Railroad wharf. It would be, if made, only a shore protection, and not a "harbor of refuge" in any degree, except at cost of dredging the entire area to be used for harbor, and dredging and keeping open the entrance from the lake.

The shore to be protected is but a low swamp for some miles back to Metairie Ridge, covered with water most of the time. The only habitable portion is the ridge, a few feet wide at the lake shore, which is only occupied at the three little villages of Milneburg, Spanish Fort, and West End.

A breakwater to form a "harbor of refuge" and at the same time a safe harbor for the lake commerce of New Orleans should be made as far out as the 10-foot curve at least, and it is far more necessary now than it was at the time of the survey, as the railroad bridge across the lake will soon cut off the only shelter on the south side of the lake which has ever been available in a hard blow from northwest, that under the lee of Pointe-aux-Herbes.

An appropriation was made in 1852 for a "harbor of refuge" and it was begun in 1853–'54, and a section of 1,500 feet of it was finished in March, 1855. This section was in front of the Pontchartrain Railroad wharf, about on the 12-foot curve. The piles, four rows, on which this breakwater was made are yet standing to low-water line, and about one-quarter of them are standing to the top, but above water line and partly rotted. Three rows of these piles supported a framework of square timber bolted on a slope, the outer edge of which was 2 feet under water, and the inner edge 5 feet above water; piles were 8 feet apart; these square timbers running across the line, and on their tops were bolted joints at intervals of a foot, to break the waves. These piles are now covered below water with barnacles, but there are no teredo in them. Taking the tops of the piles, as shown on the plan of the work, and as found now at the survey, the water surface is found to be the same in both surveys, that of 1853 and 1880, and the soundings of 1853 show the same depth in the same place as is now found, showing that in plans for harbor no allowance need be made for any filling of the lake.

Captain Williams was in charge of the Pontchartrain Railroad wharf during the building of this breakwater, and for many years after. He says that while the top was in place it acted as a good protection, but that by the fall of 1856, or during the winter of 1856–'57, the top was washed off, and since then it has been a bad obstruction in foggy weather, schooners having many times run into it to their great damage, and one schooner ran through it and was wrecked. The railroad wharf was not protected in the least except when the wind was NNE.; a point change either way would throw the swell on to the wharf. A breakwater like that of 1853 would cost, at the same rate as that between the New Canal and Pontchartrain Railroad wharf, $226,562.50, or for the distance from the New Canal to Bayou Saint John, $139,625. When its top went off the remaining piles would be only a greater obstruction to commerce than the present remains of that of 1853 now are.

Wood will last very many years below the low-water line. The piles driven in 1853 are now sound, and have, to all appearance, as firm hold in the bottom as when first driven. This would show that a work should be so made that the portion above water can be renewed, while that below low-water line would last for very many years.

Ballast can be had in any amount from the rock bluffs on Pearl River, as soon as the

work on that stream is so far completed as to permit of its navigation by tugs and flat boats. This would be better than concrete, but sand and shells for concrete, and brick bats from the brick-yards, can be had in all the rivers on the north side of Lake Pontchartrain.

A "harbor of refuge" would be large enough for all needs, and, also, would be ample for purposes of commerce, if it extended only from the New Canal to Bayou Saint John.

The commerce of the lake is now mostly schooners, in wood, charcoal, lumber, and brick trade, and a few steamers which carry passengers to the watering places on the north side of the lake; but for some years efforts have been made to connect the lake with the Mississippi River by a canal. A survey for a canal to connect them by way of Bayou Manchac was made last fall; and one for a canal through the rear of the city of New Orleans, which will answer the same purpose, of connecting the river and lake, is now talked of and is likely to be made the coming summer. This would bring a lighter class of boats into lake navigation, and would make yet more necessary a safe harbor for them on this side of the lake.

Very respectfully, your obedient servant,

H. C. COLLINS.

Maj. AMOS STICKNEY,
United States Engineers.

Commerce of Lake Pontchartrain, for the year 1881, *passing into New Orleans. No account was kept of vessels passing out.*

	New canal.	Bayou St. John.	Total.
Numbering of vessels entering	3,385	3,180	6,565
Tonnage of vessels entering	89,491	Not given.	89,491
Bales cotton	8,642	52	8,694
Lumber, board measure	57,434,000	13,647,000	71,081,000
Timber and logs, board measure	9,189,840	.....	9,189,840
Fire wood, cords	21,270	24,787	46,057
Shingles, M	10,870	2,302	13,172
Lath, M	1,761	.....	1,761
Charcoal, barrels	334,500	394,600	729,100
Tar, do	2,673	.....	2,673
Brick, M	2,510	702	3,212
Shells, barrels	38,500	2,850	41,350
Sand, do	170,900	70,670	241,570
Turpentine, do	3,690	.....	3,690
Rosin, do	26,020	.....	26,020
Live cattle	1,650	.....	1,650
Hides	18,690	.....	18,690
Sugar, tons	456	179	635
Molasses, barrels	.....	300	300
Rice, do	1,500	.....	1,500
Moss, bales	1,090	46	1,136
Oysters, barrels	.....	71,450	71,450
Cotton seed, bags	293	.....	293
Potatoes, barrels	.....	500	500
Sundries, packages	10,580	.....	10,580
Staves, M	.....	1,837,000	1,837,000

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 186.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

In response to Senate Resolution of April 5, 1882, a letter from the Chief of Engineers of yesterday's date, and the accompanying copy of a report from Lieut. T. W. Symons, Corps of Engineers, embracing all the information in this Department respecting the navigable waters of the Upper Columbia River and its tributaries, and of the country adjacent thereto.

APRIL 24, 1882.—Referred to the Committee on Printing.

WAR DEPARTMENT,
Washington City, April 21, 1882.

The Secretary of War has the honor to transmit to the United States Senate, in response to the resolution of that body of the 5th instant, calling for information on the subject, a letter from the Chief of Engineers of yesterday's date, and the accompanying copy of a report from Lieut. T. W. Symons, Corps of Engineers, embracing all the information in this department respecting the navigable waters of the Upper Columbia River and its tributaries, and of the resources of the country adjacent thereto.

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT *pro tem.*
of the United States Senate.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., April 20, 1882.

SIR: I have the honor to return herewith the resolution of the Senate of the 5th April, 1882, directing the Secretary of War to report to the Senate of the United States—

Any and all information in his possession respecting the navigable waters of the Upper Columbia River and its tributaries, and the resources of the country through

which such navigable waters pass, and the character and cost of improvements required to render said Upper Columbia and its tributaries available for purposes of transportation; and, particularly, such information and data as has been collected upon said subjects by Lieut. T. W. Symons, Chief Engineer of the Department of the Columbia.

And in response to transmit a copy of the report of Lieut. T. W. Symons, Corps of Engineers, which embraces all the information in this office respecting the navigable waters of the Upper Columbia River and its tributaries, and of the resources of the country adjacent thereto.

The examination by Lieutenant Symons was made by direction and under the instructions of the commanding general, Department of the Columbia.

Very respectfully, your obedient servant,

H. G. WRIGHT,
Chief of Engineers, Brig. and Bvt. Maj. Gen.

Hon. ROBERT T. LINCOLN,
Secretary of War.

WASHINGTON, D. C., *April* 3, 1882.

SIR: During the months of September and October, 1881, in compliance with orders from Brig. Gen. Nelson A. Miles, commanding Department of the Columbia, I made an examination of the Columbia River, to determine its navigability and the advisability of putting steamboats on it to be used in the transportation of troops, stores, supplies, &c.

In the prosecution of this duty I examined the river at the Little Dalles, Kettle Falls, and Grand Rapids, and traversed the river in a small boat from the last-named rapids, near the mouth of the Colville River, to the mouth of the Snake River, making as careful a survey as possible with the time and means at my disposal.

I have the honor to transmit herewith a report on the examination made, with a map of the river on a scale of 1 inch to 2 miles, and maps on a larger scale of several of the obstructions in the river.

The report embraces a description of the portion of the river examined and the lands in its vicinity, and also of the other portions of the Upper Columbia and the country drained by it and its tributaries, derived from my observations and travels during the past four years, and from a careful study of the reports and writings of others.

I have sought to show the economical relations of the Columbia to the surrounding country, and the importance of making that portion of it lying within the territory of the United States navigable as far as practicable, and have suggested a plan for so doing.

I have added to this a historical and geological account of the Columbia, and have endeavored to give a clear idea of the fertile and extensive

Great Plain composing the northern portion of the interior basin of the Columbia.

It is believed that the maps and information contained in this report will be of value in the navigation of the Columbia, in any questions which may arise in connection with the improvement of the river, to all persons who take an interest in the development and prosperity of the Northwest, and to all the civil and military agents of the government whose duties require of them a knowledge of the country embraced.

With the approval of General Miles I submit this report to you, with the request that it be published, and that 300 copies may be furnished for use in the Department of the Columbia.

Very respectfully, your obedient servant,

THOMAS W. SYMONS,
First Lieutenant Corps of Engineers.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. Army, Washington, D. C.

THE UPPER COLUMBIA RIVER,

AND THE

GREAT PLAIN OF THE COLUMBIA.

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CHAPTER I.

THE UPPER COLUMBIA RIVER ABOVE GRAND RAPIDS.

EXPLANATORY.

During the months of September and October of the year 1881 I made a voyage in a bateau down the Columbia River from the Colville Valley to Ainsworth, at the mouth of the Snake River, making as careful a survey of the river and examination of the rapids as the time and means at my disposal would permit. I also, while performing the duties required of me in the Colville Valley, made an examination of the Little Dalles, and of a portion of the river between the Little Dalles and Kettle Falls.

The country about the Columbia and its tributary streams is rapidly filling up with settlers and attaining an importance which it has never before had, and this influx of people is certain to continue for a long time to come, while there are large tracts of fine land available for settlement.

The time is not far distant when the question of water transportation on these upper portions of the river will demand the attention of the government. I therefore propose to make as careful and as full a report concerning this river, its navigability, and economic relations, and concerning the country adjoining it, as I am able to do, giving also maps of the river showing the obstructions, rocks, rapids, bars, &c., on a scale of two miles to the inch, with maps on a larger scale of some of the principal obstructions.

THE LITTLE DALLES.

The Little Dalles is situated by river fifteen miles south of the point where the Columbia crosses the British line, and about twenty-six miles above Kettle Falls.

The cañon of the Columbia is here deep and narrow, and no bottom lands lie along the river. The Dalles are caused by a contraction of the channel, the limestone bluffs which form the banks of the river projecting into the stream, and damming back the water into a deep, quiet stretch above. The fall here is inconsiderable, and I believe the place could be improved for navigation during low and medium stages of the river by clearing away some of the projecting points of the bluffs and the small rock islands in the stream. Years ago, when the excitement about the gold mines on the upper waters of the Columbia and Fraser

rivers was at its height, a steamer was built here and ran from the Little Dalles up the river for a distance of about 225 miles to Death Rapids, transporting supplies and carrying passengers. This steamer, the "49," during the low stages of the water, used at times to be taken down to Kettle Falls, going through the Little Dalles, and being lined back over them. The tree was pointed out to which she used to make fast in ascending the rapids.

I estimate that the removal of 40,000 cubic yards of rock, limestone, would make a good, clear channel through which steamers could pass up and down at all stages of water. The limestone rock would be very easily worked, and could be readily disposed of.

A good portage wagon road exists now around these Little Dalles.

The road to the Little Dalles leaves Fort Colville and follows down the valley of Mill Creek to its junction with Echo Valley, up which it goes as far as Bruce's ranch. From this latter point it bears westward through a gap in the hills and reaches the Columbia River by an easy descent, and follows along its left bank to the rapids. During the old mining excitement quite a town was started here, which has been almost completely destroyed by fire, the principal vestige of its former grandeur being the numerous signs still remaining along the road telling travelers where to buy their merchandise.

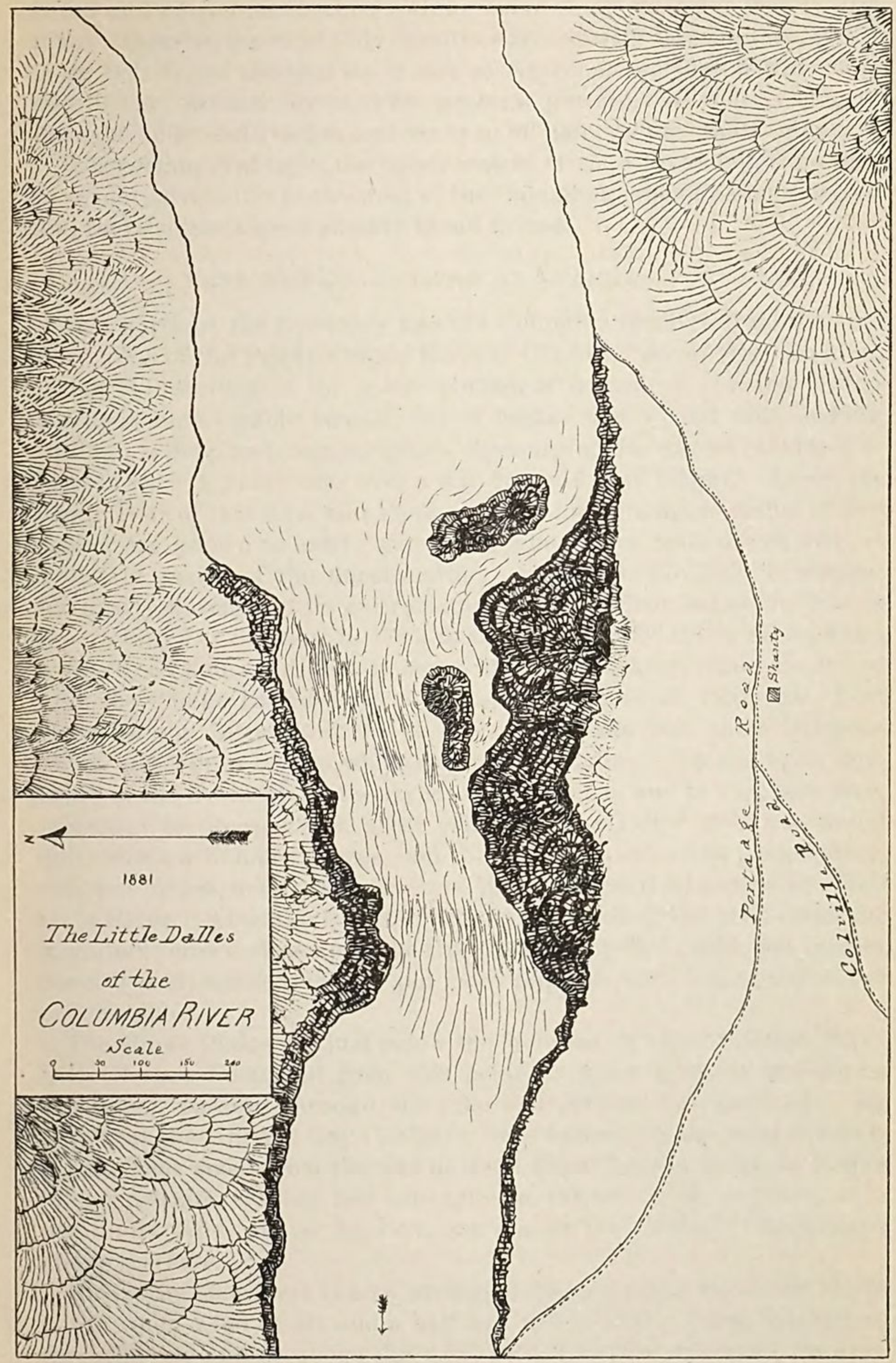
The road is very good all the way, the principal travelers over it being the Chinamen who are engaged in mining on the upper river and who go to Colville for their supplies.

COLUMBIA RIVER ABOVE THE LITTLE DALLES.

Captain Pingstone, of the Oregon Railway and Navigation Company, states that above the Little Dalles the Columbia is navigable for 280 miles to Death Rapids, and that he himself has navigated it on the steamer "49" to this point. This distance I believe to be considerably overestimated, and that it is really about 225 miles. This is the distance given by the voyageurs of the Hudson Bay Fur Company who navigated the river in their bateaux.

The country through which this navigable portion flows is mountainous as a general thing. There are, however, large areas of rather level ground, especially along the enlargements of the river known as the Arrow Lakes. I have been informed that along these Arrow Lakes lies one of the finest belts of timber known to man—cedar, white pine, and fir of large size and of the most excellent quality growing in great abundance. Upon those portions of the river beyond the navigable limit there is also a vast quantity of fine timber which will at some time in the future become very valuable and be brought to market on and in the waters of the Columbia.

Concerning the interior of the country away from the river in this extreme upper portion very little is known. From all that I can learn respecting it, it would seem certain that it is largely composed of tim-



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bered and barren mountains, with here and there some fine valleys and many extensive tracts of hilly country covered with bunch-grass, and it is my belief that the climate is not so rigorous, but that it will some day be very extensively used for pastoral purposes, as well as largely brought under cultivation and made to minister to the wants of man.

It is certain that upon the upper waters of the Okinakane, from fifty to seventy-five miles to the west of the Columbia, much fine land exists, and there settlers have already found homes.

PEND D'OREILLE RIVER OR CLARKE'S FORK.

Just north of the boundary line the Columbia receives from the east the waters of the Pend d'Oreille River or Clarke's Fork of the Columbia, which is described in the lower portion of its course as being a tempestuous unnavigable stream, full of rocks, rapids, and falls, flowing through a deep and rugged cañon, discharging its waters into the Columbia with a great roar over a fall fifteen feet in height. About the headwaters of this river and Pend d'Oreille Lake immense bodies of fine timber are known to exist; many rich mines have been discovered, as well as a quarry of the finest marble. Pend d'Oreille Lake is navigable nearly throughout its entire extent and the river below the lake is reported by Dr. Suckley, in 1853, to be navigable for thirty miles, when a fall of six and a half feet is met with. Dr. Suckley, while connected with the Pacific Railroad surveys, started October 15, 1853, from Fort Owen on the Bitter Root River in a canoe made from three bullocks' hides, and a crew of two white men and an Indian. No one knew anything of the character of the river ahead of them, and it was, therefore, necessary to proceed with great caution. The Bitter Root was found quite shallow in many places, and the canoe, which, when loaded, drew only ten inches, had frequently to be lightened until he passed the Hell Gate River. About sixty miles below the mouth of the Hell Gate, the mountains crowd close upon the river, making it very rapid, but further down it is straighter, deeper, and more sluggish, with large flats on one or both sides.

The Horse Plains are just below the junction of the Flathead River with Clarke's Fork, and from this point to Saint Ignatius Mission he proceeded, passing through the lake and making two portages. He says that the Hudson Bay Company were formerly in the habit of carrying up their goods from the foot of Pend d'Oreille Lake to Horse Plains in large boats, making two portages on the way—one probably at a point nine miles above the lake, and one at the Cabinet, fifteen miles above the lake.

Below the lake there is no obstruction to navigation for about thirty miles, when a fall of six and a half feet is met with. From this fall to the point nine miles above the lake, he thinks that steamers drawing from twenty to twenty-four inches could easily ascend, and in high water the distance might be increased from sixty to one hundred miles,

or from a point about ten miles below the mission to the Cabinet, fifteen miles above the lake. He says that at the falls a lock might easily be constructed so as to admit of navigation at all seasons.

At the Cabinet the river is compressed between rocks about one hundred feet in height, and becomes very rapid and narrow, so that the possibility of passing through with steamboats is uncertain.

At the mission the Fathers being deeply impressed with the unnavigability and dangers of the river below, and having an eye to his safety, refused to let Dr. Suckley have a canoe or an Indian guide, and so he did not examine the river from this point to its junction with the Columbia. He says, however, that from what information he could gather, he might have descended the river, proceeding cautiously and making portages, though the Indians were not in the habit of going by that route. This is probably the worst portion of the river for purposes of navigation.

The doctor proceeded overland to Fort Colville and embarked on the Columbia below the falls, and on the 6th day of December reached Vancouver, having gone all the way by water except such portages as were necessary.

I have never seen Dr. Suckley's narrative of his trip; it is condensed about as above in Governor Stevens' Pacific Railroad report.

Clarke's Fork in its upper portions drains a very beautiful and remarkable country—that lying between the Rocky Mountains proper and the spur known as the Bitter Root and Cœur d'Alêne Mountains. This great basin for which I would suggest the name of "*Missoula Basin*," is probably formed almost entirely by the erosion of the Great Rocky Mountain Plateau. The Rocky Mountain chain, extending to the northwestward through Wyoming, branches in the latitude of about 45° 30′; one branch extending to the east and northeast for about 90 miles; the other branch stretches to the west and northwest about 35 miles; the two branches then continue in about the same general direction to the northwest until beyond the boundary line, where they are about 135 miles apart. At about the 53d degree of latitude they come together again in the region separating the waters of the Columbia and Fraser Rivers. The western backbone of the Rocky Mountains is known by different names in different parts of its extent. The southern portion is called the Bitter Root Mountains; then comes the Cœur d'Alêne Mountains in the vicinity of Clarke's Fork, and the Cabinet Mountains forming the dividing ridge between this river and the Kootenay. Still further north it is the Selkirk Range separating the Kootenay from the Columbia, and extending along the Columbia and Canoe rivers until, at the headwaters of the latter, it merges with the main backbone.

The main range of the Rocky Mountains, which, between the sources of Snake River and the Three Forks of the Missouri, has a high altitude, and continues to be elevated along the region where the Jefferson Fork has its source, begins to fall soon after it branches to the east.

The divide, from this point, makes a great bend to the east and then a return bend to the west, forming nearly a semicircle, from which flow streams to Clarke's Fork. The semicircle commences at the Big Hole Prairie, where you pass from the Bitter Root River to the upper tributaries of Wisdom River, and may be said to end at the gates of Sun River. Its radius is eighty miles and its periphery one hundred miles, the center being near the junction of Hell Gate and Bitter Root rivers. Through this entire distance the whole chain is broken down, affording great numbers of passes, all of them having an altitude not far from 6,000 feet above the sea. Going north from the gates of Sun River the mountains rise in elevation, so that when we come to our boundary parallel the heights of the passes exceed 7,000 feet above the sea.

The country lying between the two great backbones of the Rocky Mountains, and especially that beautiful region whose streams, flowing from the great mountainous semicircle above mentioned, pass through a delightful grazing and arable country and find their confluence in the Bitter Root or Missoula River, has been ably described in the Pacific Railroad reports of Governor Stevens. As these reports are out of print and very difficult to be procured, I give the description of the country as published in these reports, only leaving out some unimportant details of the surveys and making some slight changes and additions. From the Big Hole Prairie on the south the Bitter Root River flows due north; it has a branch from the southwest known as Nez Percé Creek, up which goes a trail much used by Indians and *voyageurs* passing to the Nez Percé country and Walla Walla. This is now known as the Elk City trail. The Bitter Root Valley above Hell Gate River is about eighty miles long and from three to ten in width, having a direction north and south from the sources of Bitter Root River to its junction with the Hell Gate. Besides the outlet above mentioned to the Clearwater and Walla Walla countries, which is the most difficult, it has an excellent natural wagon-road communication at its head by the Big Hole Pass to Jefferson Fork, Fort Hall, and other points southward, as well as by the Hell Gate routes to the eastward. From the lower end of the valley it is believed that the river is, or can be made, navigable for small steamers, for long distances at least, thus affording an easy outlet for its products in the natural direction. This refers to that portion of the river now called the Missoula. Hell Gate is the *débouché* of all the considerable streams which unite with the Bitter Root eighty-five miles below its source at the Big Hole divide. The distance from Hell Gate to its junction with the Bitter Root is fifteen miles. It must not be understood by the term Hell Gate that here is a narrow passage, with perpendicular bluffs; on the contrary, it is a wide, open, and easy pass, in no case being less than a half mile wide, and the banks not subject to overflow at all. Here the Big Blackfoot joins the Hell Gate River.

The Hell Gate itself drains the semicircle of the Rocky Mountains

from parallel 45° 45′ to parallel 46° 30′, a distance on the divide of eighty miles. The main tributary stream of the Hell Gate pursues nearly a northerly course for sixty-five miles, then receives the waters of the Little Blackfoot River, and continuing the general direction north fifty degrees west for forty-eight miles, receives the waters of the Big Blackfoot. The upper waters of this river, now known as Deer Lodge River, connect with the Wisdom River over a low and easy divide, over which the Northern Pacific Railroad is now being built. Moving down this valley for fifteen miles, we come to a most beautiful prairie, known as the Deer Lodge, a great resort for game and a favorite resting-place for the Indians; mild through the winter and affording inexhaustable grass the year round. The remarkable Boiling Springs are in this prairie, which is watered by many streams, those coming from the east having their sources in the Rocky Mountain divide, and those coming from the west in the low, rolling, open country between the Deer Lodge and Bitter Root rivers.

The Little Blackfoot is one of the most important streams in the line of communication through this whole mountain region; it has an open, well-grassed, and arable valley, with sweet cottonwood on the stream and pine generally on the slopes of the hills; but the forests are quite open, and both on the northern and southern sides there is much prairie country. The divides between the Little and Big Blackfoot, as well as between the former and the tributaries to the south, are low, grassed, and much of them arable. The Little Blackfoot River furnishes two outlets to the country to the east, by the southern and middle branches of Prickly Pear Creek. There is another tributary of the Little Blackfoot which may furnish a good pass to the plains of the Missouri; it comes in a little way above its junction with the Hell Gate. Passing down Hell Gate River from its junction with the Little Blackfoot, we come to several streams flowing in from the south, the principal ones being Flint and Stony Creeks. On these are prairies as large as the Deer Lodge prairie, and, in fact, the whole country between the Deer Lodge and Bitter Root consists much more of prairie than of forest land.

The Hell Gate River is thus seen to be one hundred and thirty miles long, draining the broad and fertile Deer Lodge prairie, which is estimated to contain eight hundred square miles of arable land. Then, taking a direction more transverse to the mountains, its valley continues from two to five miles wide until its junction with the Big Blackfoot at Hell Gate, after which it widens out to unite with the valley of the Bitter Root. On this part of it there are at least one hundred and fifty square miles of fine arable land in the valley, and much grazing prairie on the adjoining hills. Around the Little Blackfoot most of the country is a hilly prairie, suitable for grazing, while in the immediate valley is sufficient arable land for the subsistence of a population engaged in pastoral pursuits.

The Big Blackfoot drains the semicircle from the Hell Gate Pass to somewhat north of the Gate of Sun River, the main stream flowing from the mountains at Cadotte's and Lewis and Clarke's Passes. This stream furnishes at least four passes to the Missouri, two of which were carefully examined in the course of the explorations. The river has a general course a little south of west, winding considerably in some parts, but the length of its valley is about seventy-five miles and varying from half a mile to twelve miles in width. Neither this nor the Hell Gate can be considered navigable above their junction. Its greatest rise and fall is six feet. On the 18th of July, 1855, its water-level was from eight to twelve inches above low-water mark and five feet below high-water mark. All these streams, together with the Bitter Root River, constitute a system of waters flowing from the semicircle, uniting opposite Hell Gate, and pursuing a general northwest course to their junction with the Flathead River, forming Clarke's Fork. That portion of the river from the junction of the Bitter Root and Hell Gate rivers to the junction with the Flathead is now generally known as the Missoula River. The Flathead, coming in from the north, drains nearly as large an extent and as fine a country as the Missoula. These two systems of waters are separated by a low mountain-spur, which is generally well timbered and well watered and a large portion of the land arabel.

Passing from the Missoula to the Flathead River, we cross over this spur by a low divide, going through the Coriacan defile and coming on the waters of Jocko River. The height of this divide above the Hell Gate is 560 feet, and above the Flathead River at the mouth of the Jocko is 650 feet. From this divide a view of surpassing beauty is presented to the beholder as he looks to the northward. He sees before him an extraordinarily well-grassed, well-watered, and inviting country. On the east are the divides, clothed with pine, separating the Jocko and its tributaries from the streams flowing into the Big Blackfoot and into Flathead Lake. To the north the Flathead Lake, twenty-five miles long and six miles wide, is spread out, with extensive prairies beyond, and on the west, sloping back from the banks of the Flathead River, a mingled prairie and forest country is seen. Here, in a compact body, is one of the most promising countries in this whole region, having at least 2,000 square miles of arable land. It is now the Flathead Indian Reservation. Above the lake the Flathead River is formed by the waters of three streams. Below the lake the river follows its windings some fifty miles to its junction with the Missoula, where the united streams assume the name of Clarke's Fork. It is from 100 to 200 yards wide and so deep as to be fordable with difficulty at low-water, its depth being three feet at the shallowest places. Its current is rapid, and there is a fall of fifteen feet five miles below the lake. About eighteen miles below the lake it receives a considerable stream from the northwest, called Hot Spring Creek, in the valley of which there is a large extent of fine land. Sixteen miles further to the south it receives

Jocko River from the southeast, when it turns abruptly to the northwest and in nineteen miles joins with the Missoula. The Flathead River, by passing the rapids and falls below the lake with a short canal, gives a navigable stretch of at least seventy-five miles to the head of Flathead Lake.

The lower portions of Clarke's Fork have been already mentioned. Above the Cabinet (fifteen miles above Pend d'Oreille Lake), the river would be excellent for rafting purposes. Its greatest rise and fall is fifteen feet. The valley of Clarke's Fork is generally a wide, arable, and inviting settlement, though much of it is wooded. The prairies occupy but an inconsiderable portion of its valley and the surrounding country, yet there is no deficiency of grass. On the river are several celebrated wintering-places for Indian horses, as Horse Plains, Thompson's Prairie, and the country about Pend d'Oreille Lake.

The passes which lead from this Missoula basin to the Great Plain of the Columbia are that crossed by the Southern Nez Percé trail, now known as the Elk City trail, leading from the upper waters of the Bitter Root; the Lo Lo pass crossed by the northern Nez Percé trail, pursued by Lewis and Clarke in their great explorations, and now known as the Lou Lou trail; the Cœur d'Alêne pass, over which the Mullan road now goes; and the pass by way of Clarke's Fork.

The Southern Nez Percé trail goes up the southwest fork of the Bitter Root (Nez Percé Creek), and, crossing a dividing ridge, winds about over the summit of the high and rugged mountains separating the Kooskooskia from the Salmon River, taking a very circuitous course to the junction of the main forks of the Kooskooskia. Elevation of the pass, about 7,600 feet. This is a mere Indian trail which avoids the densely-wooded valleys and goes over the mountain summits, where the elevation prevents the growth of trees and substitutes a growth of grass. Should it be found practicable to cut a road down the valley of the Kooskooskia or Clearwater, the divide between it and the Bitter Root is still nearly 7,000 feet in altitude.

The Lou Lou trail is in character much the same, but its course is more direct. It passes up the valley of the Lou Lou fork of the Bitter Root, and, crossing to a branch of the Kooskooskia, winds along the heads of branches flowing into the main streams of this river till it comes out on the Great Plain at the same place as the southern trail. The mountain traveling required in crossing by the southern trail is about 138 miles, and by the northern trail is about 120 miles.

Between these two trails there are undoubtedly passes across the mountains much lower, but they are blocked up with fallen timber and rendered almost inaccessible on account of this and the steep, narrow valleys. It is claimed that a practicable railroad route exists by a pass called the Ska-ka-ho, or Skal-ka-ho Pass, which leaves the Bitter Root Valley nearly at its head.

The Cœur d'Alêne pass, now occupied by the Mullan road, goes from

the east up the St. Regis Borgia River, crosses a divide 5,090 feet above the sea, and descends to Cœur d'Alêne Lake by way of the Cœur d'Alêne River. It is too well known to need any description.

The pass by way of Clarke's Fork crosses by the Jocko cut-off from the Missoula to the Flathead River, using the Coriacan defile, and keeps on down the Flathead River and Clarke's Fork and around Pend d'Oreille Lake. This is the route adopted by the Northern Pacific Railroad, which continues on up Hell Gate and Deer Lodge rivers and crosses to the Big Hole, or Wisdom River, by the Deer Lodge pass.

From the divide of the Rocky Mountains to the divide of the Bitter Root Mountains there is this intermediate region or Missoula Basin, over one-third of which is a cultivable area, and a large portion of it is a prairie country, instead of a wooded or mountain country. The following estimate gives the amount of arable land as far as existing information allowed it to be computed (1855):

In the region watered by the Missoula and the Bitter Root and their tributaries, not including Hell Gate, 3,000 square miles; in that watered by the Hell Gate and its tributaries, 2,500 square miles; in that watered by the Big Blackfoot and its tributaries, 1,300 square miles. The country watered by the Flathead River down to its junction with the Missoula, and thence down Clarke's Fork to the Cabinet, has a prairie region of 2,500 square miles. The country watered by the Kootenay has 2,000 square miles of prairie. Thus we have, in round numbers, 11,200 square miles of arable and prairie land.

Later determinations, based upon the land-office surveys indicate that this is not an overestimate.

Governor Stevens says that the timber land will be found unquestionably better than the prairie land; that it will not be in the immediate bottom or valley of the rivers that farmers will find their best locations, but on the smaller tributaries some few miles above their junction with the main stream. The observing and thinking man will be astonished at the conclusions which he will reach in regard to the agricultural advantages of this country. As soon as the railroads reach it and proper facilities for transportation are afforded, it will establish its superiority as an agricultural region.

THE KOOTENAY RIVER.

About twenty-five miles above the boundary there comes into the Columbia from the east the Kootenay River. The lower part of this river is unfit for navigation on account of rapids and falls, but if a short portage is made around this bad portion of the river a navigable portion is reached which is probably about 300 miles in extent.

The Kootenay rises near the fifty-first parallel of latitude, runs south to near the forty-eighth, then north and west, reaching the Columbia at about 49½° north latitude. Its course is generally through a mountainous timbered country, but with belts and sections of rich agricultural

and grazing land. This country is known to be very rich in the precious metals, for the Kootenay and nearly all the streams flowing into it are gold-bearing, some of them being very rich.

Lack of public means of transportation and the difficulties and expense of prospecting have for many years deterred prospectors and miners from carrying on their work in these regions. With easy and cheap lines of transportation into the country I believe that gold and silver mining would, and should, revive and become a matter of great importance.

BELOW LITTLE DALLES.

From the Little Dalles to Kettle Falls the cañon of the Columbia is more open and much good bottom land exists along the river. In some places the hills are timberless and covered with bunch grass, and have been used for many years by the Indians of the vicinity as winter pasturage grounds for their herds of ponies. The timber along this portion of the river is not very good, being mostly bull and black pine of small size. There are some good tracts of fine timber scattered here and there, and away from the river it becomes better.

There are several good-paying gold-bearing bars along the river, especially Six-mile and Twelve-mile Bars, each of which has a wagon road leading to it from Echo Valley. The hills bordering the river are low and have an abundant depth of rich, black soil, and are undoubtedly capable of cultivation, and will be occupied and cultivated as soon as the more accessible bottom lands are taken up.

This remark holds good for the greater portion of the country between the Columbia on the west and the Pend d'Oreille on the east. Settlers will not go to the trouble of clearing off land when they can find it already fit for the plow; but land of this latter kind will not last forever; when it is gone they will have to take to the woods.

Just above Kettle Falls, on the left bank of the river, lies the valley in which the old Hudson Bay Company establishment is located. This is a fine, low-lying, fertile valley, two miles long and one mile wide, and at the northern end of it is the old fort occupied by the British boundary commissioners for two winters of the years during which they were engaged on their survey. These buildings are in a good state of preservation, and are occupied as dwellings and stores. Two traders, with quite large stocks of goods, seem to find considerable business here in trading with settlers, Chinamen, and Indians. Just across the river from the old British fort, in the Colville Indian Reservation, there is a large tract of fine arable land, some of which lies low, near the river, and some on benches and rolling hills further away. Throughout this Colville Indian Reservation there is an immense amount of as fine agricultural and grazing land as can be found anywhere in the Territory.

By far the greater proportion of the Indians for whom this reservation was set aside do not live on it, but live in the Colville and other valleys,

where they have taken and claim the choicest portions for themselves. They thus act as a hinderance to the settlement of the country outside of their reservation, at the same time holding their reservation and keeping settlers away from it. Either they should be compelled to vacate their lands held outside the reservation and remove to it, or they should relinquish their reservation and allow it to be thrown open to settlement. By far the best way to settle the question is to give them complete and inalienable titles to such homesteads as they may choose to select, either on the reservation or off, and then throw open the reservation to settlement. At the same time all male Indians over twenty-one years of age should be made full citizens. As the lands outside the reserve have been ordered to be surveyed and subdivided, it is highly probable that the question will soon be settled by the Indians being removed to their reservation and made to reside upon it, unless the land in severalty plan is adopted.

GENERAL DESCRIPTION OF COUNTRY ABOUT FORT COLVILLE—THE COLVILLE VALLEY.

The Colville Valley, one of the pleasantest and finest valleys to be found anywhere in the Northwest, has been retarded in its settlement and advancement many years by the fact that it is occupied and the lands held in large quantities by Indians and half-breed descendants of the old Hudson Bay fur-traders. These people, owing to the way they have been treated and the insecure tenure on which they hold their lands, are shiftless and unprogressive, make no effort to improve and beautify, and are a stumbling-block in the way of civilization. When the land is surveyed and can be taken up according to the laws of the country, and titles be obtained, settlers will assuredly flock into the country, and Colville Valley will take the high rank that it deserves to hold among the most productive, pleasant, and beautiful regions of the earth.

An accumulation of drift and dense growth of underbrush in and along the lower portion of the Colville River has caused it during the higher stages of water to overflow its banks and inundate large areas of this valley. A small expense would remove all this obstruction and double the agricultural area of the valley, at the same time rendering it more healthy.

Fort Colville and the town of Colville are situated about fifteen miles from the Columbia, in the valley of Mill Creek, which is a branch of Colville River.

To the east of Fort Colville the hills and mountains commence, and stretch over to the Pend d'Oreille River, with here and there an attractive valley. In this direction trails lead to different points on the latter river, especially to the Calispell Lake and Mission.

The mountains are not high, are timbered, and abound in game. To the north of Fort Colville there is a pretty valley, called Echo Valley,

an offshoot from Mill Creek Valley. It is bounded on the east by the same timbered mountains that lie east of Colville, and on the west by a low range of hills, partly timbered and partly covered with bunch grass; through it are one or more gaps leading to the Columbia River. Through this valley the road goes to the Little Dalles. Two roads go from Fort Colville towards the west, one down Mill Creek through Spanish Prairie, joining the other, which goes direct to the Colville River at the mouth of Mill Creek; hence they keep on together until just beyond the Catholic Mission, where they divide, one going to Rickey's Landing, below Grand Rapids, and on down the Columbia, one to Kettle Falls, and one to the old British Commission Fort Colville.

The country about the Colville River for the last few miles of its course is sandy and not fit for cultivation except in a few spots. To the south of Fort Colville the regular mail road leads to Fool's Prairie; here it branches, one branch going to Walker's Prairie and the Lower Spokane bridge, and one being the new military road to Spokane Falls. Between the Colville River and the Columbia the mountains are rather high, and are densely covered with timber as far as could be seen.

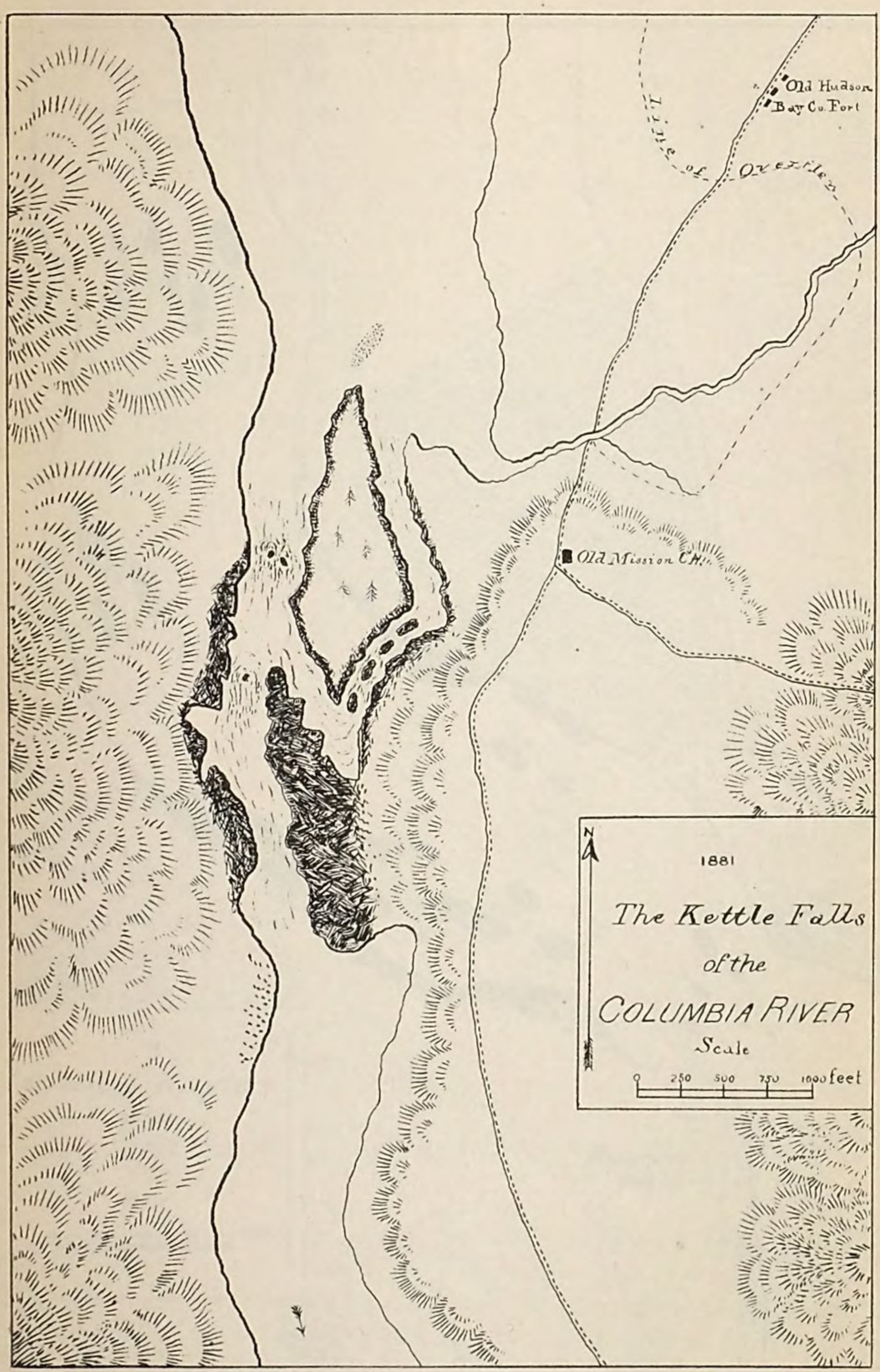
KETTLE FALLS.

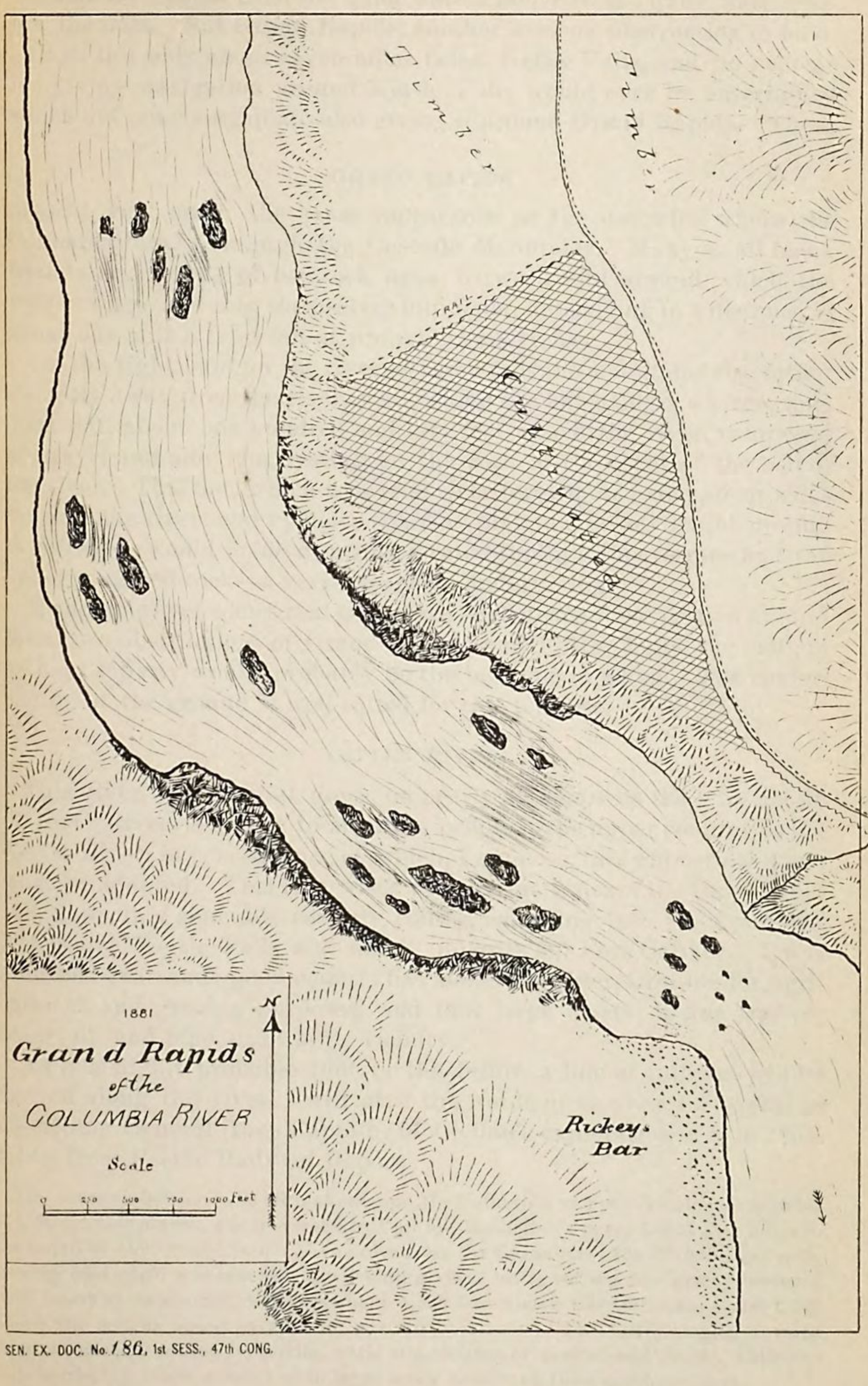
Kettle Falls, the Chaudière Falls of the early Canadian *voyageurs* and the "Sometknu Falls" of the Indians, are situated about four miles above the mouth of the Colville River, sixteen miles from Fort Colville, and about 711 miles up the Columbia from its mouth. They take their name from the fact that the falling waters converge and give the pool below the appearance of a huge boiling cauldron. They are the most complete and total obstruction to navigation met with on the Columbia, the perpendicular fall being about twenty-five feet at low water, divided into the upper fall of fifteen feet, and the lower one of ten feet, the two falls being within a few rods of each other.

The channel is very much contracted by the projecting rocks and islands, as shown in the sketch of the falls accompanying this report.

If at any time in the future it should become necessary to improve or to discuss the improvement of these falls to give navigation around them, I would suggest a plan by which I think that it could be done at a comparatively small expense, owing to the peculiar conformation of the shores and islands.

A glance at the accompanying map of the falls will show that a large island lies near and parallel with the left bank. There is a channel between this island and the left bank, in which the main fall between the island and the right bank is distributed over the entire distance. This channel has at present some rocks in it which could be removed without difficulty, and has a good entrance at the upper end. Below the island is a projecting point of rock just about at the level of the highest water. Through this point a channel could be cut and in it a lock placed, the material taken from the channel being placed in the inter-


Old Hudson Bay Co. Fort
Line of Overflow
Old Mission Ch.
1881
The Kettle Falls
of the
COLUMBIA RIVER
Scale
0 250 500 750 1000 feet



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val between the island and projecting point, forming thus a continuous channel for a canal from the quiet waters above to the quiet waters below the falls. But Grand Rapids, another serious obstruction to navigation, lies only about seven miles below Kettle Falls, and no scheme for giving navigation around Kettle Falls would ever be entertained which did not contemplate also giving it around Grand Rapids. These

GRAND RAPIDS

present very much the same appearance as the cascades where the Columbia breaks through the Cascade Mountains. Many small black islands and points of bed-rock arise, between and around which the waters surge and toss themselves into foam, descending in a distance of about one mile a total fall of probably twenty feet.

On the right bank of the river at these falls the mountains rise rather abruptly away from the river, while along the left bank is a large, fine, open flat, about one hundred and fifty feet above the river, composed of gravel and alluvium, resting on the rock at the level of the bed of the river. This flat, which is a true river terrace, has very steep sides towards the river, and I believe that any plan to give navigation around these rapids would involve cutting a canal through this terrace and the underlying bed-rock—a very expensive undertaking.

If the time ever comes that commerce shall demand navigation around these two obstructions of Grand Rapids and Kettle Falls, the method by boat railway would probably be the best one to adopt. The conformation of the ground is well suited for this purpose.

KETTLE RIVER.

This river, which is put down on nearly all maps as the "Ne-hoi-al-pit-qua" River, is known to all white people in the upper country as the Kettle River, in consequence of which, I suppose, this unpoetical name must be adopted. This river rises within a few miles of the Okinakane, and flows in a generally easterly course, emptying into the Columbia just above Kettle Falls and nearly opposite old Fort Colville. I was informed that much good country lies along this river, suitable for agricultural and grazing purposes, and that large tracts of fine timber, cedar, fir, and pine, exist in its vicinity.

As it is highly probable that in the future a line of railroad will be located along this river, I will give the words of Governor Stevens, in describing General (then Captain) McClellan's exploration of it in 1853, taken from Pacific Railroad Report:

> The country between the Okinakane and the Columbia at Fort Colville, sixty miles in a direct line across, was traversed by Captain McClellan's party about fifty miles to the north of the Great Plain. Five miles from the Okinakane, the Ne-hoi-al-pit-qua, flowing eastward, was reached, the dividing ridge being rolling and grassy, covered with forest at its summit, which is about 1,500 feet above the Okinakane and 2,647 above the sea, as observed with an aneroid barometer. The valley sloping toward the east, though narrow, is fertile, with alternations of prairie and forest, while the hills bordering it are wooded with large trees, mostly on their northern slope.

CHAPTER II.

GRAND RAPIDS TO THE SPOKANE RIVER.

PREPARATIONS FOR THE JOURNEY.

Having completed the work assigned me in the country about Fort Colville, I made preparations for my voyage down the Columbia.

I was fortunate enough to procure from John Rickey, a settler and trader, who lives at the Grand Rapids, a strongly-built bateau, and had his assistance in selecting a crew of Indians for the journey. The bateau was about thirty feet long, four feet wide at the gunwales, and two feet deep, and is as small a boat as the voyage should ever be attempted in, if it is contemplated to go through all the rapids. My first lookout had been to secure the services of "Old Pierre Agare" as steersman, and I had to carry on negotiations with him for several days before he finally consented to go. Old Pierre is the only one of the old Hudson Bay Company's Iroquois voyageurs now left who knows the river thoroughly at all stages of water, from Colville to its mouth. In the palmy days of the fur traders, he came with them from Canada, and made many voyages down and up the Columbia, married and settled at Colville, and now has a large family of children, grandchildren, and great-grandchildren about him. The old man is seventy years of age, and hale and hearty, although his eye-sight is somewhat defective, which is almost a certain accompaniment of old age with an Indian.

The other Indians engaged were Pen-waw, Big Pierre, Little Pierre, and Joseph. They had never made the trip all the way down the river, and their minds were full of the dangers and terrors of the great rapids below, and it was a long time before we could prevail upon them to go, by promising them a high price and stipulating for their return by rail and stage. Old Pierre and John Rickey labored and talked with them long and faithfully to gain their consent, and I am sure that they started off with as many misgivings about getting safely through as we did who had to trust our lives to their skill, promptness, and obedience.

When all was ready we entered the boat and took our stations, Old Pierre in the stern at the steering oar; next our baggage, upon which I took my station; then came the four Indian oarsmen, and in the bow Mr. Downing, topographical assistant. Mr. Downing and myself both worked independently in getting as thorough a knowledge of the river as possible, he taking the courses with a prismatic compass, and estimating distances by the eye, and sketching in the topographical features of the adjoining country, while I estimated also the distances to marked points, and paid particular attention to the bed of the river, sounding wherever there were any indications of shallowness.

Each evening we compared notes as to distances, and we found them to come out very well together, the greatest difference being $6\frac{3}{4}$ miles

in a day's run of 64¼ miles. Some days they were identical. The total distance from our starting point, just below Grand Rapids, to Ainsworth, at the mouth of Snake River, was estimated by Mr. Downing to be 363.25 miles, and by myself to be 350 miles. His distances were obtained chiefly by estimating how far it was to some marked point ahead, and correcting it when the point was reached; mine by the time required to pass over the distances, in which the elements considered were the swiftness of the current and the labor of the oarsmen.

The following are the distances, as estimated for each day's run by Mr. Downing and myself:

Days.	Downing.	Symons.
	Miles.	*Miles.*
First	46. 25	42. 00
Second	8. 50	8. 50
Third	22. 75	23. 50
Fourth	64. 25	57. 50
Fifth	34. 60	34. 00
Sixth	56. 25	50. 00
Seventh	58. 25	62. 50
Eighth	57. 00	56 00
Ninth	15. 75	16. 00
Total	363. 25	350. 00

As a general thing, it was deemed best to use the greater estimate of the day's run in plotting the notes, and the final distance adopted was 365.5 miles.

GRAND RAPIDS TO SPOKANE RIVER.

September 29, 1881, 9:40 *a. m.*—Everything being in readiness, we pushed off, Rickey giving us his last words of advice, and the Indians, their squaws, and friends, keeping up a chaffing sort of conversation, in which they were no doubt encouraging each other to be of good cheer.

Three miles below we came to a collection of black-rock islands in the middle of the river. The islands are apparently of black basalt, and rise from thirty to fifty feet above the water at the present stage, and have a great deal of drift-wood upon their tops, and lodged in the crevices of their sides. To all appearances there is a channel on both sides of the rocks. We took the one toward the left bank, which I think is much the better. On account of the contraction caused by these islands there is quite a strong rapid here, which, however, would offer no obstacle to a good steamer. It is altogether probable that in higher stages of water the current becomes stronger, and at highest water an ordinary steamer might have some difficulty in getting through.

About nine miles further down we passed by a small village of Sans Poil Indians, on the right bank of the river. Opposite this village the river is quite shallow, the bottom covered with large gravel and bowlders, which were plainly seen from the boat. The depth is about six feet along the middle of the stream, and as the water is considerably above extreme low water, this depth would probably be decreased to four, and

may be to three feet at lowest stage. There appeared some evidences of the depth being somewhat greater toward the right bank, but of this I am not certain.

Some distance below we pushed through a portion of the river containing a number of rocky island points, sunken rocks, and points jutting out from shore. Among these rocks are several sharp little ripples with strong eddies, but nothing that can be considered as an obstruction to navigation.

At one p. m., at a distance of twenty and one-fourth miles from Rickey's Landing, we came to *Turtle Rapids*, which result from the presence in the stream of a number of large and small black-looking bed-rock islands. The main and best channel passes about in the center of the stream between the islands. The water is quite strong and rapid, but I do not consider that a steamer would have great difficulty in stemming the current at any stage of water.

In running through, care would have to be taken to avoid sunken rocks.

About three miles further, after passing a large, promising-looking bar, on which a number of Chinamen were engaged in mining, we came to another rapid, of minor importance, however, caused by a point of rock jutting well out into the stream from the left bank.

Six and one-half miles on and we came to Rogers' Bar. Both above and below this bar there are quite strong ripples, the one just above being quite shallow, with, however, sufficient water for purposes of navigation.

Four and one-half miles further on we came to what is called the *Elbow Bend* of the river. Here are some bed-rock islands with a gravel-bar island near the right bank, and jutting points of rock below, also from the right bank. The channel is near the left bank all the way, with a rather strong ripple near the rock islands.

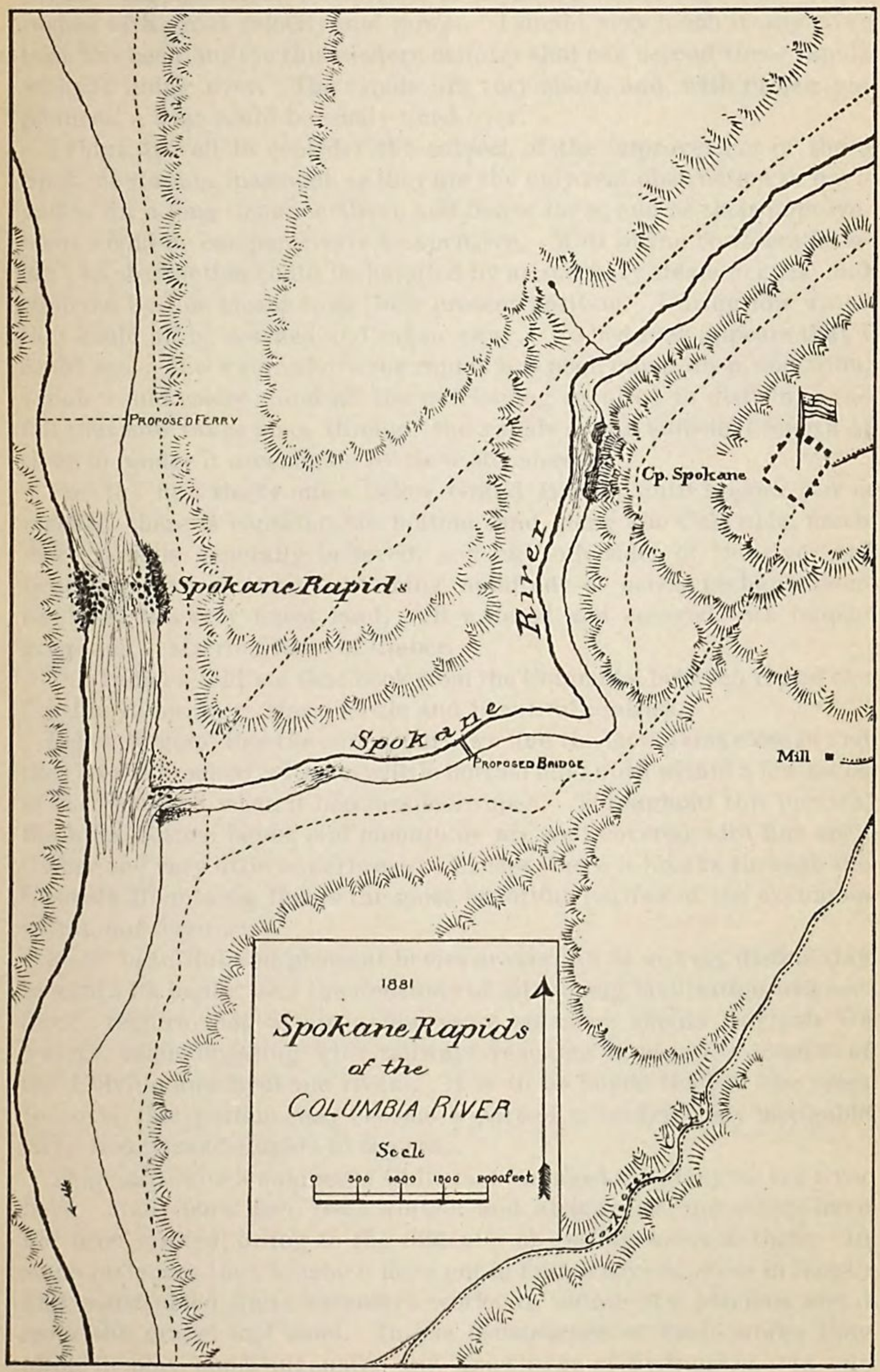
After four miles further traveling we passed some more bad water, swift and strong, with rocks near the left bank, offering, however, no obstruction to navigation; and at 4:40 we went into camp on the right bank of the river, where a pretty stream comes down, having made a distance of forty-seven and three-fourths miles during the day.

September 30, 7:28 *a. m.*—Left camp, and four miles below passed a very rugged portion of the left bank of the river. Among the rocks was one resembling very much a bishop's mitre, being conical and split down the center. I have called it *Mitre Rock.*

At 9:10, four and a half miles further on, we entered the mouth of Spokane River, and made camp, having passed through the *Spokane Rapids*, which are situated about a half mile above the mouth of the Spokane.

These rapids are the most serious obstructions to navigation met with since leaving Grand Rapids.

The river runs through a narrow channel between its two banks,



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which are contracted and covered with great bowlders and massive rocks. The space free from rocks is narrow, and through it the water rushes with great velocity and power. I doubt very much if any river boat has been built in this western country that can ascend these rapids without lining over. The rapids are very short, and, with proper appliances, a boat could be easily lined over.

I think it well to consider the subject of the improvement of these Spokane Rapids, inasmuch as they are the only real obstruction to navigation for a long distance above and below them, and as their improvement would be comparatively inexpensive. Most of the bowlders forming the obstruction could be handled by an ordinary steam derrick, and removed by this means from their present position. During low water they could all be reached and taken away. No bed-rock appears that I could see. The water above the rapids is a pool, quiet, deep, and wide, which would easily stand all the quickening required to distribute the fall that now takes place through the rapids over a sufficient length of river to render it ascendable by river steamers.

For the first thirty miles below Grand Rapids, until Rogers' Bar is reached, there is considerable bottom land along the Columbia, much more than is generally believed, and on both sides of the river are benches, some of them containing hundreds of acres, perhaps thousands, of the very finest land, well watered and covered with bunch-grass and scattering belts of timber.

The Indians told me that back from the Columbia, between it and the Colville River, were many fertile and beautiful prairies.

Below Rogers' Bar the cañon narrows and the mountains close in and the river is crooked, with very little bottom land until within a few miles of the Spokane, when it becomes more open. Throughout this portion, the hills, bottom lands, and mountains are well covered with fine open timber and very little underbrush. Except where it breaks through the Cascade Mountains, this is the most beautiful portion of the Columbia within our territory.

Many beautiful and pleasant homes are certain at no very distant day to adorn its banks, and the demands of advancing civilization will certainly require that within a few years steamers should navigate its waters, communicating with railways reaching it near the mouths of the Colville and Spokane rivers. It is to be hoped that, in the years to come, this portion may become a part of a continuously navigable river from Grand Rapids to the sea.

There are quite a number of Chinamen engaged in mining on the river bars. Many bars have been worked and abandoned, and others have not been worked, owing to the difficulty of getting water to them. In some instances the Chinamen have put in flumes several miles in length and constructed quite extensive works to obtain the precious metal from the gravel and sand. In the construction of these works they often display much ingenuity and knowledge of hydraulics. In one

place just below the Spokane River they have taken the water from Hawk Creek and conducted it about three miles in ditches and wooden flumes made of whip-sawed lumber, and have taken it to a large bar-island in the river, crossing the intervening channel by means of an inverted siphon, also made of whip-sawed lumber.

THE SPOKANE RIVER.

The Spokane River at its mouth is about 200 feet wide, and flows through a cañon very similar to that of the Columbia, and about 2,000 feet below the general level of the plains to the south. It is broken by many rapids and falls, and is entirely unnavigable. From its mouth up to Spokane Falls, about seventy miles, this cañon is very deep and difficult to cross or traverse. This river, with that portion of the Columbia from its mouth to the Okinakane, forms the boundary line between the rich and treeless great Columbia Plain on the south, and the more rocky, timbered, and mountainous country to the north.

Camp Spokane is situated on a level terrace plateau about one and a half miles from the mouth of the Spokane, and four hundred feet above it, on its southern bank. From this plateau it is easy to descend to the Spokane and Columbia rivers, and to ascend to the great plains to the south.

The Spokane River, by its situation and characteristics, is bound to play an important part in the settlement and ultimate well-being of the whole country within a great distance of it.

At Spokane Falls is a magnificent water-power, one of the finest in the world, and situated as it is in the midst of a splendid agricultural country, most of which, however, is treeless, there seems no room to doubt that it will become a great manufacturing and commercial center.

By means of the river and Cœur d'Alêne Lake, and the tributary streams of the latter, a magnificent and widely-extended area of timber-land lying along the Cœur d'Alêne and Bitter Root Mountains can be made to yield its forest covering for transportation by water to Spokane Falls, there to be manufactured into lumber and distributed throughout the agricultural lands to the south and west. In return for this lumber and fuel, these lands will send their wheat to the falls to be manufactured into flour, and sent from there to the seaboard to be shipped to the markets of the world.

Large portions of the country are better suited for pastoral purposes than for agricultural, and it is reasonable to expect that here at these falls will be erected great woolen manufactories, to work up the raw produce of the country into the cloths and blankets required by the inhabitants thereof.

Large quantities of brown hematite iron ore have been found near the Spokane River below the falls, and it is known that other iron deposits lie to the north.

Quantities of flax have been grown the past few years in the country to the south of Spokane Falls, and it must also be brought to this great water-power to be manufactured into thread, cloth, &c., and the seed into oil.

The number of manufacturing enterprises for which this place seems adapted is very great. I may enumerate, besides those mentioned above, the manufacture of all kinds of wooden ware, of agricultural and farm implements, wagons, carriages, furniture, leather, harness, boots and shoes, pork, beer, and iron and metal works in great variety. Large numbers of emigrants have been and are coming into this Spokane country, lured hither by the fine agricultural prospects, by the abundance of remunerative labor, the prospects of large manufacturing establishments, and the bright mining outlook. This influx of emigrants will be largely increased as soon as railroads reach the country and render it cheaper and easier for them to come.

The Spokane, in the upper part of its course, presents the estimable peculiarity—especially valuable in view of its use as a water-power—of never freezing.

It seems to be fed by many springs between the falls and Cœur d'Alêne Lake, which have the effect, in the coldest weather, of keeping the temperature above the freezing point.

Immediately about the falls the soil is not adapted to farming on a large scale, as it is more or less rocky and gravelly. It is, however, on this account, particularly well fitted for building purposes.

The total fall of the river is about one hundred and thirty feet, divided into several plunges and rapids, and broken by islands and rocks, and so situated that its entire force can be controlled and brought into use.

It would seem as if nature could not have done more to make this a great manufacturing and commercial center, and a beautiful, healthy, and attractive place.

My duties required me to remain several days about Camp Spokane, doing work and making examinations required by the department commander, among which were the location of a bridge over the Spokane River and a ferry over the Columbia, the object being to furnish facilities for the troops to cross these rivers and penetrate into the Indian country. The locations selected are marked on the map of the portion of the river about the mouth of the Spokane.

On account of the swiftness and turbulence of the water below, it was necessary to locate the ferry above the Spokane Rapids. Estimates for the bridge were sent in, and the troops have been ordered to build it.

CHAPTER III.

COLUMBIA RIVER, FROM THE SPOKANE RIVER TO LAKE CHELAN.

Having finished work about Camp Spokane on October 3, at 11:45 a. m. we pushed out from the Spokane River and took our course down the Columbia. At 12:15 we had run the five miles to the mouth of Hawk Creek, and the ranch and trading post of William Covington, generally known as "Virginia Bill." Hawk Creek heads at Cottonwood Springs on the old White Bluffs road. It is about twenty-five miles long, and flows for the greater part of the way through an extremely deep and precipitous cañon. Virginia Bill has constructed a wagon-road from the Great Plain near Cottonwood Springs to his ranch, which is an excellent road, and the best way to reach the Columbia from the upper plain with which I am familiar. There is an easy grade and a firm soil all the way, and I believe a practicable railroad route could be laid out to the river in the vicinity of this road.

The river between the Spokane and Hawk Creek is very swift and strong, the current running from six to eight miles an hour.

A couple of miles further on we passed the mouth of Welsh Creek, so named from a settler on its banks in the valley about four or five miles from the river. Some of the prettiest country in the world is situated upon Welsh Creek and its branches. There are beautiful little valleys nestled in among the rolling, timbered hills, and beyond, up on the great plain, mile after mile of bunch-grass-covered gently-sloping prairie.

The river now becomes very deeply encañoned with steep, rocky, and, in some cases, perpendicular bluffs, on one or both sides. The cañon is in many places very beautiful; the rocks composing the bluffs are many-colored, black, brown, pink, and white, and have many patches of bright red and yellow moss. To this must be added the green of the trees, of which all shades, from the darkest to the brightest, appear; the bright autumnal tints of the bushes, and beyond, above, and about all, the old gold of the withered bunch-grass shining in the sunlight.

The rocks take all imaginable forms, showing up as pinnacles, terraces, perpendicular bluffs, devils-slides, and giants' causeways, the whole forming one of the grandest, most beautiful sights in the universe. The material of which the rock is composed is all apparently of igneous origin, trachyte and basalt. With this, especially on the north side of the river, there is a great deal of volcanic tufa in a more or less friable condition.

About eight miles further on we come to the Whitestone, a noted landmark, consisting of a gigantic grayish-white rock, 500 feet high, standing perpendicularly up from the water, on the left bank of the river, and being partially detached from the rocks to the rear. It is split down the middle by some great convulsion. The Indians have a legend concerning this rock, of which the skunk is the hero.

It would seem that in the long ago a skunk, a cayote, and a rattlesnake each had a farm on the top of the Whitestone. These were the days before the skunk was as odorous as he is now, but was esteemed a good fellow and pleasant companion by other animals. As in some other small communities, jealousies, dissensions, and intrigues arose in this one. The result was that the cayote and rattlesnake took a mean advantage of the skunk one night when he was asleep, and threw him off the rock, away down into the river. He was not drowned, however, but floated on and on, far away to the south and west, until he came to the mouth of the river, where lived a great medicine-man and magician. To him the skunk applied and was fitted out with an apparatus warranted to give immunity from, and conquest over, all his enemies. Back he journeyed along the river to his old home, where he arrived, much to the surprise of the cayote and rattlesnake, and commenced to make it so pleasant for them with his pungent perfumery apparatus, the gift of the magician, that they soon left him in undisputed possession of his rocky home, which he has maintained ever since.

Opposite the Whitestone comes in Whitestone Creek from the north. Near here we came to a trading-post, on the left bank of the stream, occupied by a man named Friedlander, who carries on quite a trade with the Indians and Chinamen along the river. He reaches his place by a wagon-road from the Great Plain above, and informed me that it is an excellent road and one of the best ways of getting to the river that there is. We remained with him until 3:10, inquiring about the country, the Indians, &c., and at a distance of two miles from his place we reached *Hell Gate*. At the head of the rapids a great jutting point sticks out from the left bank, narrowing the channel; below this, in the middle of the river, is a great rock island, with the channel to the left; below and nearer the right bank are two other rock islands. These islands form a partial dam to the water and cause rapids, which commence between the jutting point and the first great island and continue for a considerable distance below the last rock island. The channel is very crooked, as will be seen by a glance at the map of this portion of the river. Although a bad place, it seems to me that a good steamer would easily ascend the rapids and go through if the proper course was taken. This course, I should say, would be to hug the north bank until nearly to the islands, then cross over to the south bank and steam well up to the jutting point of rocks, and then cross over between this jutting point and the first islands, and then around the jutting point. The only danger that a steamer would encounter coming down would be that something would happen to the steering-gear.

During a high stage of water the jutting point mentioned above becomes an island, and the currents are changed, and it probably would be a much worse place to go through than during low and medium stages.

Three miles below we passed the mouth of the *Sans Poil River*. This

comes in from the north, rising in the mountains nearly due west of Kettle Falls, and flows through a region in which there is much good farming land. This word has been variously spelled, but the above I believe is correct, as it seems to be a French name applied to the Indians living along its banks, on account either of the scarcity or shortness of their hair and beard, or from the fact that they were very poor and had no furs to sell to the traders. Old Pierre told me that this latter was the origin of the word.

After passing through two ripples we went into camp, at 4:30 p. m., on the left bank near an immense spring, which came pouring out from the rocks about fifty feet above the river. This day we made about twenty-three and a half miles.

Tuesday, October 4, 7:52 a. m., we started again on our trip, having passed an uncomfortable night on account of the rain, which gave us a severe wetting. The timber has been getting scarce, and along this portion of the river very little is seen, except where some breaking away of the northern bank gives a glimpse of the distant hills, which are covered with forests.

We row along very quietly and pleasantly, with an occasional ripple and rock, and now and then a bar-island and rather shallow place in the river.

10 *a. m.*—After about eleven miles are passed we come to the mouth of the Grand Coulée, which, however, would not have been noticed if old Pierre had not told us, as it presents the same appearance as the rest of the left bank, the Coulée bottom being high above the river.

Six miles further on we came to Monaghan's Rapids. These are caused by a number of small rocky islands. The channel is toward the left bank. During the early winter of 1879 and '80, James Monaghan, of Colville, one of the most enterprising men of the country, went from Colville with some rafts of lumber and supplies to the troops camped near the Okinakane. On these rocks he struck with some of his rafts and had great trouble to get off. I have named them for him. The country here, what we can see of it, presents a very weird, wild appearance. It breaks away on both sides with white cliffs in the distance, and in the foreground large black rocks, about the size of houses, scattered here and there over the brown earth, and now and then a lone, sorrowful-looking pine tree.

These isolated rocks present a very excellent example of the tremendous transporting power of moving ice. They have evidently been brought down from the upper regions of the river on floating ice, which, emerging from the cañons, has grounded with its immense loads on the gently-inclined banks of this portion of the river. The rocks are mainly basalt, of crystalline structure.

About two miles further down we come to another strong ripple, caused, as before, by rocks in the stream. One of these immense rocks



A GLIMPSE OF THE GRAND COULÉ

seemed to be nearly spherical and to rest in an apparent state of very unstable equilibrium. These I have called Equilibrium Rapids.

Six miles further we passed the mouth of the Nespilem River. A strong ripple exists just above the mouth and a great bar-island just below. The country here is very much terraced and broken on the northern side. Down the river further, on the south bank, a large, fine bench extends along the river for several miles. It is divided into two or three terraces and covered with bunch-grass.

The river is generally very good until at about eight and a half miles further we reach Cannon or Mah-kin Rapids, which are nearly a mile long and very swift. They seem to be caused by a contraction of the water-way between the rocky banks. The water is very swift, but I think that at this season a steamer could ascend them. It would be very difficult, however, and at most seasons it would be necessary to use a line.

These rapids may be considered as the limit of navigation for a great part of the year; and a portage road built around the Great Nespilem Rapids below should embrace these Mah-kin Rapids.

This gives a stretch of river from Grand Rapids to Mah-kin Rapids, which can, I believe, generally be navigated, the only two obstructions of note being Spokane Rapids and Hell Gate.

Mah-kin Rapids are the first bad rapids of the Nespilem Cañon. The river is here contracted in width and the banks are steep and rocky. A little below, the shores are strewn with huge masses of black basaltic rock of all sizes and shapes, and this continues for several miles, forming a characteristic picture of Columbia River scenery. The complete silence and lifelessness added to the scene makes it exceedingly wild, almost unearthly. And so we plunge along swiftly through the rolling water, with huge rocks looming up, now on one side and then on the other. Every stroke of the oar is bearing us onward, nearer and nearer, to that portion of our voyage most dreaded, the terrible Kalichen Falls and Whirlpool Rapids. We hear the low rumbling of the water, and see the tops of the huge, half-sunken rocks and the white foam of the tumbling waters. For a few moments the rowing ceases, while brave old Pierre gives his orders to the Indians in their own tongue. He knows that everything depends upon his steering and their rowing or backing at the right moment, with all the strength that they possess. Years ago he was in a Hudson Bay Company bateau which capsized in these very rapids, and out of a crew of 16 men 8 perished in the water and on the rocks. The Indians make their preparations for the struggle by stripping off all their superfluous clothing, removing their gloves, and each ties a bright-colored handkerchief tightly about his head; poles and extra oars are laid ready in convenient places to reach should they become necessary, and then with a shout the Indians seize their oars, and commence laying to them with all their strength. We are rushing forward at a fearful rate, owing to the com-

bined exertions of the Indians and the racing current, and we shudder at the thought of striking any of the huge black rocks near which we glide. Now we are fairly in the rapids, and our boat is rushing madly through the foam and billows; the Indians are shouting at every stroke in their wild savage glee; it is infectious; we shout too, and feel the wild exultation which comes to men in moments of great excitement and danger. Ugly masses of rock show their heads above the troubled waters on every side, and sunken rocks are discernible by the action of the surf. Great billows strike us fore and aft, some falling squarely over the bows and drenching us to the waist. This is bad enough, but the worst is yet to come as we draw near with great velocity to a huge rock which appears dead ahead.

Has old Pierre seen it? The water looks terribly cold as we think of his failing eyesight. Then an order, a shout, backing on one side and pulling on the other, and a quick stroke of the steering oar, and the rock appears on our right hand. Another command, and answering shout, and the oars bend like willows as the Indians struggle to get the boat out of the strong eddy into which Pierre had thrown her. Finally she shoots ahead and passes the rock like a flash, within less than an oar's length of it, and we shout for joy and breathe freely again. This eddy becomes in a high stage of water a veritable whirlpool, with the well at its center many feet in depth. Hence the name of Whirlpool Rapids.

For half a mile now the river is comparatively good, and our staunch crew rest on their oars preparatory to the next struggle, which soon comes, as some more rocky, foamy rapids are reached. Here the swells are very high and grand, and our boat at one time seems to stand almost perpendicularly. Through parts of these rapids the river is very narrow, from 300 to 400 feet, with perpendicular banks 100 to 200 feet in height.

For about nine miles further the river continues studded with rocks, and swift, with ripples every mile or so, until we reach Foster Creek Rapids. Here the rocks become thicker, being generally toward the left bank, with the channel near the right, and the water fierce and wild. For a mile more we plunge and toss through the foaming, roaring water, amid wild yells from our Indian friends, and we emerge from the Foster Creek Rapids, which appear to be as rough and dangerous as any place we have yet encountered.

We are now fairly out of the Nespilem Cañon and through all the Nespilem Rapids, and we certainly feel greatly relieved, and make for the shore and camp at the mouth of Foster Creek, where some of the companies of the Second Infantry passed, very uncomfortably, the winter of 1879–'80.

This portion of the river through which we have come to-day is the worst on the whole river, the most complete bar to navigation. From Mah-kin Rapids to Foster Creek Rapids, a distance of about twenty-seven miles, the river is exceedingly rough, with many rapids, rocks, and

ripples, and a contracted, crooked channel. I had no means of determining the fall of the river in this portion of its course, but it is very great. A steamer could come down through this stretch of river, but at considerable risk; I doubt very much if a steamer could get up through it except at great expense, time, and risk.

Foster Creek is important, as it is along its course that a wagon road finds an easy descent from the level of the Great Plain to the Columbia, and by the same route a railroad will be certain, at some future day, to follow. This day's traveling we made about sixty-three miles.

October 5, we made an early start, and at 8:15 a. m. reached the Okinakane. I spent considerable time examining the country to the east of the Okinakane, and found it to consist of a large flat, covered for the most part with rich bunch grass, and the soil of black alluvial loam, although there were some patches of sandy, gravelly soil near the Columbia.

This flat embraces about four square miles, and upon the hills and bluffs to its rear there are indications of fine springs. Water could certainly be easily obtained by digging.

Further away from the river the country rises into bluffs and great terraces and plateaus, which give the promise of being fine productive land. There is a great deal of good land along the Okinakane River and in its vicinity, and good mines are known to exist. Some mines were discovered, and were claimed and worked, before the reservation along the river was set apart for Chief Moses and his people. Disputes have arisen between the miners and the Indians in regard to the right of the former to pursue their work. This has been the subject of a recent decision at Washington, that those mines which were discovered before the reservation was set apart belong to the discoverers and owners, who must not be interfered with in working them. At the mouth of the Okinakane was a camp of Indians, fine fierce-looking bucks and cleanly-looking squaws. The latter were engaged in working about the camp, cooking, making moccasins or gloves, or mending clothes, while the men were either gambling or making arrows and fishing-spears.

I went into their camp and tried to get into conversation with them, but they were very cold and surly and regarded me with suspicion, and I was reminded of the remark of Alexander Ross, an early Astorian and Northwestern fur trader, called forth by a long residence among the Indians at old Fort Okinakane and throughout the fur regions. He says:

> From Chili to Athabasca, and from Nootka to the Labrador, there is an indescribable coldness about an American savage that checks familiarity. He is a stranger to our hopes, our fears, our joys, or our sorrows; his eyes are seldom moistened by a tear or his features relaxed by a smile; and whether he basks beneath a vertical sun on the burning plains of Amazonia, or freezes in eternal winter on the ice-bound shores of the Arctic Ocean, the same piercing black eyes and stern immobility of countenance equally set at naught the skill of the physiognomist.

The following extracts are from the volume of Ross Cox, a member of the first party to visit the Okinakane, and for a long time in charge of Fort Okinakane:

I had a long summer before me; it is the most idle season of the year; and as it was intended to rebuild and fortify Okinakane during the vacation, I lost no time in setting the men to work.

The immediate vicinity is poorly furnished with timber, and our wood-cutters were obliged to proceed some distance up the river in search of that necessary article, which was floated down in rafts. We also derived considerable assistance from the immense quantities of driftwood which was intercepted in its descent down the Columbia by the great bend which that river takes above the Okinagan. Many hands made light work, and our men used such dispatch that before the month of September we had erected a new dwelling-house for the person in charge, containing four excellent rooms and a large dining hall, two good houses for the men, and a spacious store for the furs and merchandise, to which was attached a shop for trading with the natives.

The whole was surrounded by strong palisades fifteen feet high and flanked by two bastions. Each bastion had in its lower story a light brass four-pounder, and in the upper, loopholes were left for the use of musketry.

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The climate of Okinagan is highly salubrious. We have for weeks together observed the blue expanse of heaven unobscured by a single cloud. Rain, too, is very uncommon; but heavy dews fall during the night.

The situation of Okinagan is admirably adapted for a trading town. With fertile soil, a healthy climate, horses in abundance for land carriage, an opening to the sea by the Columbia, and a communication to the interior by it and the Okinagan, the rivers well stocked with fish, and the natives quiet and friendly, it will in my opinion be selected as a spot pre-eminently calculated for the site of a town when civilization (which is at present so rapidly migrating towards the westward) crosses the Rocky Mountains and reaches the Columbia.

The following extract from the same book, "Adventures on the Columbia River," is given for the benefit of consumptives and as a hint to the medical fraternity. If it does not cure it certainly would be highly beneficial as a system to bring into general adoption for reasons which will be palpable to every one who loves not cur dogs.

The Okinagan mode of curing some of our diseases would probably startle many of the faculty. The following case in particular passed under my own observation:

One of the proprietors had in the year 1814 taken as a wife a young and beautiful girl whose father had been one of the early partners, and whose mother was a half-breed (her grandmother having been a native of the Cree tribe), so that, although not a pure white, she was fairer than many who are so called in Europe. He proceeded with her to Fort George, but the change of climate from the dry and healthy plains of Forts des Prairies to the gloomy forests and incessant rains on the northwest coast was too much for her delicate frame, and she fell into a deep consumption. As a last resource, her husband determined to send her to Okinagan to try the change of air, and requested me to procure her accommodation at that place for the summer. This I easily managed. She was accompanied by a younger sister and an old female attendant. She was in fact little more than a skeleton, with scarcely any symptoms of vitality, and her whole appearance betokened approaching dissolution.

Such was the state of the unfortunate patient, when an old Indian, who had for some days observed her sitting in the porch door, where she was brought, supported on pillows, to enjoy the fresh air, called me aside, and told me he had no doubt of being able to cure her provided I should agree to his plan, but added that he would not give

any explanation of the means he intended to use, for fear we might laugh at him, unless we consented to adopt them. We accordingly held a consultation, the result of which was that the Indian should be allowed to follow his own method. It could not make her worse, and there was a possibility of success.

Having acquainted him with her acquiescence, he immediately commenced operations by seizing an ill-looking, snarling cur dog, which he half strangled, after which he deliberately cut its throat. He then ripped open the belly and placed the legs and feet of the patient inside, surrounded by the warm intestines, in which position he kept them until the carcass became cold. He then took them out and bandaged them with warm flannel, which he said was "very good."

The following day another dog lost its life, and a similar operation was performed. This was continued for some time until every ill-disposed cur in the village had disappeared by the throat-cutting knife of our dog-destroying doctor, and we were obliged to purchase some of a superior breed. While she was undergoing this process, she took in addition a small quantity of bark daily in a glass of port wine. In the mean time the swelling gradually decreased, the fingers lost their corpse-like nakedness, the hectic flushes became rarer, and that "most pure spirit of sense," the eyes, gave evident tokens of returning animation. When her strength permitted, she was placed on the carriage of a brass field-piece, supported by bolsters, and drawn occasionally a mile or two about the prairie.

The Indian continued at intervals to repeat this strange application until the swelling had entirely disappeared, and enabled her once more to make use of her limbs.

Two-and-thirty dogs lost their lives in bringing about this extraordinary recovery.

She gradually regained possession of her appetite; and when her husband arrived in the autumn from Fort George, for the purpose of crossing the mountains, she was strong enough to accompany him. The following summer on my journey across the continent I met them at Lac la Pluie. She was in the full enjoyment of health.

The following extract from Gov. I. I. Stevens's report of the exploration of General (then Captain) G. B. McClellan is given as being of interest in connection with the Okinakane River:

On October 5, 1853, the party proceeded northward from Fort Okinakane, along the river of that name, and on the 9th reached a point in latitude 49° 26′, about thirteen miles south of the Great Lake. There is little difficulty in any part of this valley for road-making, but, as it leads to no pass westward, further exploration was not necessary.

The Hudson Bay trail to Fort Langley, on Fraser's River, leaves it about latitude 49° across a mountain ridge, to the west fork of the Okinakane, and another between that and Fraser's River. It is represented by all as barely practicable, and going directly across the mountains instead of through any pass.

The west fork (the Similkameen), near the confluence, has no valley—running through an immense ravine, impracticable for any road.

On October 12, 1853, leaving the Okinakane at the forks, they traveled eastward, crossing a high ridge to a small river (Kettle River) flowing into the Columbia, opposite Fort Colville, where they arrived on the 18th, ferrying the baggage over in canoes and swimming the animals safely over. The country traversed since leaving Fort Okinakane is thus described:

The north bank of the Columbia, between the Methow and Okinakane, is low, sandy, and barren, but rises into grassy slopes at a few miles distance, which towards their summits become covered with pine woods.

The forest evidently descends lower towards the north, and with the improving grass shows the influence of more abundant rains.

After going about twelve miles up the Okinakane, the country gradually improves in appearance, pines and cotton-woods grow more abundantly, and there is evidently a large extent both of the valley and rolling hills bordering it capable of cultivation.

At sixty miles, however, lofty wooded hills close in on its banks, and thence to the forty-ninth parallel it presents little inducement for settlement, though capable of furnishing abundance of excellent timber.

There is a fine fall on the Okinakane, thirty-five miles above its mouth, of five feet pitch, and about twenty miles further up, on its west fork, four miles above the junction, another fall of ten feet, supplying abundance of water-power. On the top of the lofty table of the Great Plain, opposite the mouth of the Okinakane, is a considerable extent of pine woods, several thousand feet above the Columbia, into which it could be easily thrown or slid down, as the cliff is almost perpendicular. This is probably the highest point of the plain, and is the point where a spur appears to cross the river and to sink into the levelof the plain.

I am strongly of the opinion that at the mouth of the Okinakane there is bound to be a commercial and manufacturing center at some time in the future, when the whole country is thrown open to settlement. There is a great deal of excellent land in its vicinity for agricultural and grazing purposes, and it is easily reached from any direction.

By striking Foster Creek at its head and following it down, a very easy and gradual descent is found to the river; thence, keeping along the left bank of the Columbia over very favorable ground until a point opposite the Okinakane is reached, is an excellent railroad route. Thence, if the Okinakane is navigable, steamers could penetrate into the interior, or, if not, a line of railroad could be built along the river, and a commerce of great extent would grow up as soon as these Indian reservations are thrown open to the public and settlers discover their attractions. The fine tracts of timber found along the Okinakane in its upper parts would furnish one of the most important articles of commerce, being floated down the river to its mouth, there to be manufactured and shipped by water down the river, or by rail, to the people settled on the Great Plain opposite. Opposite the mouth of the Okinakane the bluffs back away to a considerable distance, and leave near the river a fine flat containing from three to four square miles. The timber mentioned by Captain McClellan as covering the bluffs opposite the mouth of the river is very much exaggerated. Only a small amount exists on the slopes of the bluffs near the top, and in the gullies near the top. The appearance from the river is deceptive, and would lead any one to believe that there was considerable timber there; but personal examinations made by me in 1879 disprove this. There were no white people living anywhere in the vicinity where I passed.

About nine miles from the Okinakane the Methow River comes in from the northwest. The country on the right bank of the Columbia between these two rivers consists of a succession of nearly level benches or terraces, some having very fertile and rich soil, and others being composed largely of sand drifts. These benches stretch away from the river to the timber, which appears on the higher grounds about 6 or 7 miles to the rear.

The Methow River is a stream of considerable size, being fordable only at the lower stages of water. It shows evidence that during high water it becomes a terrible torrent—deep, wide, and swift. The country

in its vicinity is strewn with great bowlders, which extend into the Columbia River, being the principal cause of the Methow Rapids, which here form an impediment to the navigation of the Columbia. These rapids are not bad enough to prevent steamers from going up or down, at any rate during low and medium stages of water, although the water is very swift. It is highly probable that during high water steamers might not be able to ascend without the use of a line.

The river between the Okinakane and Methow is very good for steamboating, with the exception perhaps of a bar situated at a bend of the river about two miles below the Okinakane. Upon this bar there was about seven feet of water when we passed over it, which depth would probably be reduced to about three or four feet at extreme low water.

Captain McClellan's report speaks of the Methow in this fashion:

> The Methow River, which was explored nearly to its sources, has a considerable extent of good agricultural and grazing land in its upper valley. Its lower part, for twenty miles up, is hemmed in by high wooded hills; above this, they become more rolling and grassy, and its banks are bordered by level wide terraces of better soil than those on the Yakima.

I have understood that quite a number of Indians live in the Upper Methow Valley.

After two and a half hours more of pleasant traveling through a good river, with a swift and even current, and here and there a little ripple and sand-bar island, we reached the river landing opposite Lake Chelan, and made camp among our old friends the Chelan Indians, whose principal village is located here. In-no-mo-setch-a, the chief, is an old man, and is one of the best Indians that it has ever been my lot to meet. The highest character is given him by all who know him, for honesty, sobriety, entire trustworthiness, and a cheerful desire to give everybody all the assistance in his power. He was absent when we arrived, but soon returned. His oldest son, "Bill," however, met us with apparent joy and did all he could to make us comfortable. He had been unfortunate of late in getting into a fight with another Indian, who had cut his nose almost completely off his face. He had it all plastered up with some kind of pitch ointment that the Indians prepared, but he will be a noseless Indian for the remainder of his life.

Chelan Creek comes into the Columbia about one mile below the Indian village; it is about two and a half miles long from the lake to its mouth, in which distance it has a fall of about 250 feet.

I first visited Lake Chelan in the summer of 1879, when searching for a site for a military post in its vicinity. Colonel Merriam of the Second Infantry, and I, with In-no-mo-setch-a and one of his sons, paddled about twenty-four miles up the lake in a dug-out canoe, and found that the farther up we went the more grand and beautiful the scenery became. About its mouth there is a large area of arable prairie land. The hills in the vicinity are covered with trees, and the lake shores,

with the exception of those near the outlet, are completely timbered. The shores are in places exceedingly steep, the granite walls rising smooth and shiny, without a tree or blade of grass, for a thousand feet or more from the water's edge.

Numbers of beautiful little streams put into the lake, and generally about their mouths there is a fine series of flats or benches. One which I recall to mind on the south shore of the lake, about twelve miles from the mouth, is one of the most beautiful places that I have ever seen. Fine timber exists along the lake, and can easily be cut and put in it and brought down to its mouth. Colonel Merriam afterward went further up the lake, and says that the timber becomes better and better as the lake is ascended, and cedar is foudn about the head of it, which region he describes as being wonderfully grand. At the extreme upper end he found solid vertical walls of rock, and on these, several hundred feet above the water's edge, were a large number of hieroglyphics written on a horizontal line, evidently by people in boats when the waters were at this higher level. Above the first line were others at varying altitudes, but always in a horizontal line. The present Chelan Indians could tell nothing about them, but said that they must have been made by people who lived there long before they came there to reside.

I hope during the coming summer to go up the lake and examine and sketch these aged marks. Perhaps it may be possible to interpret them, and thus gain a link in the chain of the history of the aborigines of this country. Similar marks are said to exist in a rocky point on Lake Pend d'Oreille, which the Indians regard with superstitious awe, never going by them, believing that they form the outward token and sign of the evil spirit, who will punish them if they go near.

In the spring of 1880, the troops which had been encamped at the mouth of Foster Creek for the winter, removed to Lake Chelan, and Camp Chelan was established just where the lake narrows into the creek, on a beautiful bunch-grass-covered plateau on the north bank, stretching back about a mile to the rocky and timbered hills. Here the work of erecting a saw-mill and building the post was carried on with vigor and rapidity, considering that everything had to be done by the labor of the troops, with a very little assistance from outside.

Temporary dwellings had to be erected, brick made, logs cut and brought down and made into lumber at a temporary mill, the saw-mill built, roads made from the river up the steep bluffs to the lake, and a thousand other things done which can only be appreciated by those who have to build a post in the wilderness, hundreds of miles away from any point of supplies. The chief drawbacks to this post were the terrible road getting down to the river from the Great Plain on the east, the descent being about 2,500 feet; the crossing of the river where there was quite a swift current; and the ascent of the hill to the lake. All these drawbacks so impressed themselves upon the mind of General Schriver, inspector-general of the division, that he reported very strongly

against the location, and recommended that it be abandoned and some other point selected for a post. This was done, and the present site of Camp Spokane was selected.

While the troops were in this vicinity and in constant intercourse with the Indians, the condition of the latter visibly improved; they learned to do many things in the mechanic arts that they had not known before; they were willing to work and many of them earned considerable sums of money, and a feeling of desire to labor and prosper, and lay up for the future, was rapidly taking the place of the old careless improvidence.

Procuring a couple of ponies from the Indians, Mr. Downing and myself went up the steep road and over the plain to pay a visit to the lake and the old camp. Everything was about as the troops had left it, and it certainly presented a sorrowful appearance, with its tent and shanty frames standing, the deserted sutler's store, and old tin cans and commissary boxes innumerable. There was quite an amount of lumber piled up in good condition, and everything was untouched and undisturbed by the Indians; not an Indian was visible except an old squaw, who had been to some point up the lake and gathered a large basket of elderberries which she was carrying home on her head. The Indians could make themselves very comfortable in some of the deserted buildings if they were so minded, but they prefer their homes on the river at the foot of the bluffs, where fine springs gush out and they have rich, productive gardens.

During the night our sleep was disturbed by the howlings and moanings of an old medicine man, who was performing his hideous incantations over a poor girl nearly dead with the consumption. They did not seem to know of the Okinakane dog cure of consumption, or did not wish to spare their dogs for this purpose.

The general character of the country in the vicinity of the river from Spokane to Chelan may be described in a few words. The river flows through a deep and rugged cañon with very little bottom land along its banks. It can be approached from the Great Plain on the south only in three places: by the Virginia Bill road, Whitestone road, and Foster Creek. From the north it can be approached in more places, and generally wherever a stream comes in a good easy way exists of getting to the river. The country to the north has been very much more eroded than that to the south.

Soon after leaving the Big Bend the timber begins to disappear from the river, and soon can only be seen in scattering trees in the ravines, and in large quantity only when a vista allows a sight of the distant northern hills.

When the Colville Indian Reservation is thrown open to settlement, and becomes populated with thrifty and industrious whites, a railroad will be needed up the Sans Poil Valley. But of course this will not be required for a long time.

CHAPTER IV.

LAKE CHELAN TO SNAKE RIVER.

October 6.—We left Chelan at 7 :30, after saying good-bye to our Indian friends, and with a good swift current went gliding rapidily along. In about one mile we passed the mouth of Chelan Creek, a roaring little stream. Passing through an occasional ripple, we came soon to some quite strong rapids, caused by a collection of rocks near the left bank. These I have called "*Downing's Rapids*," from my assistant, Mr. Alfred Downing, who, during the previous year while encamped at the Chelan Crossing, got adrift in a small boat and went through this portion of the river at night, and was wrecked in Rock Island Rapids, and barely escaped with his life.

At seven miles from Chelan Creek we came to a rapid, where the water flows over a bowlder and gravelly bar, on which there was a depth of from seven to eight feet. The current sets very strongly from the left to the right bank. We pass three small streams coming in from the west, and begin to meet with some of the beautiful rock scenery with which we are soon to be charmed. The right bank of the river is a steep, rocky bluff, about 2,000 feet in height, and is striped with strata of different-colored rocks, principally white, gray, nearly black, and dark brown. It is all volcanic rock, and the *Ribbon Bluff* presents a very handsome appearance. Five or six miles further down we come to the Enti-at-qua River, a fine stream, coming in from the west. There is quite an Indian village on its banks, and several of the Indians were engaged in spearing salmon from canoes, paddled and poled along the the shallows by assistants. Just below the mouth of the Enti-at-qua River there are a number of bar islands, and the river is very shallow. We apparently went in the main channel, and I found only three feet of water over the bar. It is barely possible that a deeper channel exists, but I do not think so. The river is spread out and the bar is evidently formed by the material brought down by the Enti-at-qua, when, in the spring or summer, it becomes transformed into a raging torrent. As it was considerably above low water when we came down, it would appear that this bar may cause considerable trouble during the very low stages of water, and boats should be made as light in draught as possible to pass over it. This is the shallowest water met with yet. At the lower end of the bar is quite a strong little rapid.

Five miles further down there is a commanding point on the left bank, from which a view can be obtained for a long distance up and down the river, and has for many years been used by the Indians as a lookout station. I called it Longview Point. A short distance of about a mile below Longview Point there is a large number of rocky points, rising from the water near the right bank, causing swift, turbulent water,

which will probably get much worse as the water rises. The river is now excellent as far down as the Wenatchee River, which we reach at 1:30. This river, for the lower part of its course, flows through a level plain of fine agricultural land, containing from twenty to thirty square miles. To the west rise the foot-hills of the Wenatchee Mountains, and we get a view now and then of the snowy summits.

Across the Columbia the bluffs, which have lined the river bank pretty closely since Chelan was left, here break back considerably into more rounded hills, and it is possible that skillful engineering may, in time, bring a railroad down to the river at this point, if it ever becomes necessary or desirable. This has always been a favorite crossing-place with the Indians, and their trails lead from here in every direction.

There is one settler at the mouth of the Wenatchee, a man named Miller, who has a store and a ranch, with a very promising orchard. The Columbia here widens considerably, and the Wenatchee has deposited in it an enormous amount of *débris*, forming at the present stage a number of flat bar islands, and causing a very decided shallowing of the river, there being not more than three or four feet of water in what appeared to be the main channel. Any steamboat-landing for Wenatchee River had better be below the mouth about a mile or more. At the lower end of these flats there is a strong rapid. Mr. Miller informed me that there was a pretty good wagon-road, which had been built during the occupancy of Chelan as a military post, from the Kittitas Valley to the mouth of the Wenatchee. It goes down the Columbia for five or six miles and then breaks to the west.

After leaving the Wenatchee for a few miles the river was very good, but we soon began to encounter rapids and rocks in great abundance. Looking down, we see almost a continuous wall across the river, formed by the uplifted island points, and around us bubbles and whirls the water over the sunken rocks, whose heads lie just below the surface. The rocks are projecting points of black basaltic rock, and this is certainly a part of the river requiring skillful navigation. The rock-bound shores are steep and rugged. On we glide, winding in and out among the rocks, guided by the experienced hand of old Pierre, and soon we begin to hear a more decided roar and rumble on ahead, and to realize that we are fast nearing the dreaded Rock Island Rapids. Soon the boat is steered to the shore, and old Pierre gets out, and, with his Indians, goes on ahead to take a look at the state of things below and determine on his course through the rocks, and explain to the Indians what they must do. Finally, after an animated discussion among them, it is decided, and all return to the boat and prepare for the passage, as at the Nespilem Rapids, by removing gloves and all superfluous clothing and tying red handkerchiefs tightly about their heads. Choosing the right-hand channel, our boat hugs the right bank pretty closely, passing safely the upper ripple, and apparently going straight for some

jagged, rocky points jutting out from the shore below. Before she reaches them, however, she is caught in an eddy, and it is only by the most supreme exertion that our oarsmen can get her out. Finally she is free, and away she goes like a bird, shooting through between the jutting points and the large island into the main rapid, where she is almost engulfed in the tumbling, roaring waters; on she goes into the river below, and then makes for the shore, and we go into camp for the night on the right bank, just below the rapids.

Much better idea can be obtained of these rapids by the map of them which accompanies this report than can be formed by any description. There are two channels, the east and west. We used the west, and at this stage of water I have every reason to believe that a good, powerful steamer, properly handled, could go up it.

Old Pierre says that in extreme low-water this channel becomes nearly dry, and in this condition is unnavigable. This west channel is considerably wider than the east one, and is quite straight, except at the lower end, where it is rendered crooked by the jutting bed-rock.

The east channel is the deeper one and is the better one, Pierre says, in low-water, and also in extreme high-water, but in ordinary stages the west one is the better.

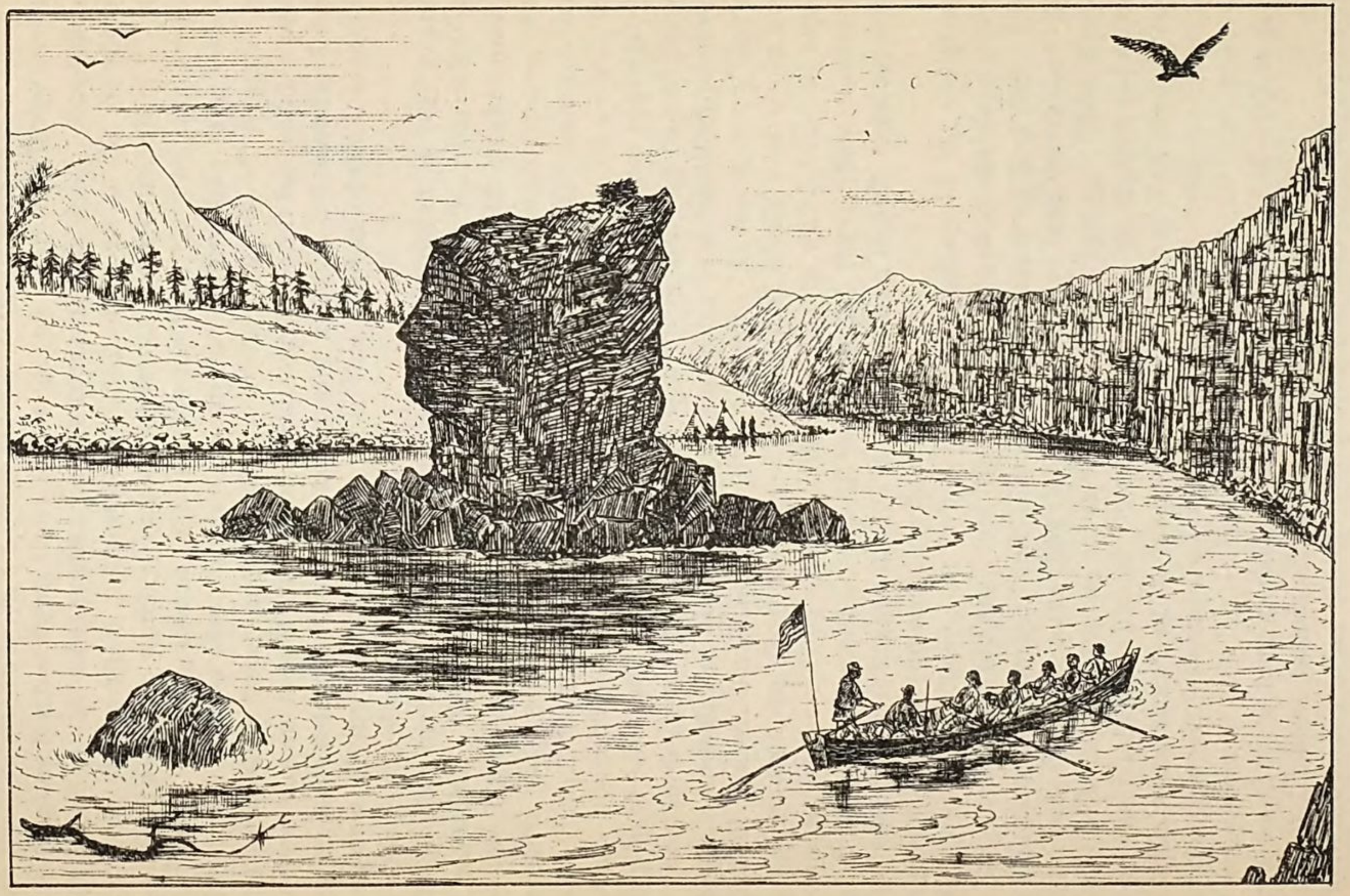
The small steamer Chelan was brought down during high-water through the east channel, and she struck two or three times on account of breaking her rudder, but managed to escape. The course is very crooked, and there is quite a fall near the head of the large island which divides the channel. There are several sunken rocks among the rapids.

In regard to the improvement of navigation at these rapids, the proper system to be adopted can only be determined after observations extending over months have been taken. I will hazard the assertion, however, that for all ordinary stages of water the west channel can be made navigable by the removal of rocks and jutting points. In comparison with the Nespilem Rapids, the obstructions caused by these rapids is slight.

All along on the east side of the Columbia the bluffs are precipitous and 2,000 to 2,500 feet in height, being in some places nearly perpendicular and in others slightly broken away. In some places the bluffs recede short distances from the shore to give place to bowlder flats. The west side is still more mountainous, but is broken here and there by a small stream, and through the gaps distant views of wooded and snowy mountains are had. Nothing of this kind breaks the monotony of the eastern shore. There are several Indian farms along the river between Chelan and these rapids, and a number of Chinese miners were passed during the day. An excellent route for a portage exists along the western shore on a terrace about one hundred feet above the water.

After leaving the main rapids we passed through about one mile of river in which were many rocks, and then through a rapid of considerable strength. Then came a quiet stretch of water for three or four miles,

N
1881
Rock Island Rapids
of the
COLUMBIA RIVER
Scale
0 500 1000 1500 2000 feet
Stevens Rock
Plateau
Strong Eddy
Level



Lieut. T.W. Symons and A. Downing del.

SEN. EX. DOC. No. 186, 1st SESS., 47th CONG.

VICTORIA ROCK

and Cabinet Rapids were reached. These are caused by rocks sticking up near the left bank and jutting out therefrom. The rapids are swift and bad, and if the river is to be navigated must be improved by removing some of the points of rocks and regularizing the slope. Just below these rapids there is a Coulée mouth on the left bank.

A few miles further down there stands in the Columbia River a rock which is one of the most perfect profile rocks in existence. Approaching it from the north, it presents a striking likeness to the profile of Queen Victoria, from which circumstance it was given the name of "Victoria Rock." Coming nearer to it and passing it on the west, the profile changes and merges into a more Grecian and Sphinx-like face, whose placid immobility takes one's mind involuntarily to far-off Egypt. It rises from the surface of the water about one hundred feet, and a pair of eagles have selected it as their home, and upon its extreme top have built a nest, giving, as it were, a crown to this goddess of the Columbia. The rock is of columnar black basalt.

The portion of the river in which this rock is situated is very grand and beautiful. The banks are nearly precipitous bluffs, from 2,000 to 3,000 feet high, composed of columnar black basalt, which takes many wonderful shapes and produces many pleasing effects, rivaling the famous Giant's Causeway of Ireland in weird beauty. The columns are in every conceivable position, sometimes piled up like cordwood, in some places erect, and in others inclined; some great masses are twisted and bent, forming niches, arches, grottos, crowns, &c. In one of these niches, a thousand feet above the river, there lies in an inclined position a stick of timber, barkless and white with age. It never grew there. It is a thousand feet from the top of the vertical bluffs, and could not have been put there from above. The only way in which it could have reached its present position was by being caught there when the river was a thousand feet higher than it is now, drifting in and lodging, and being left there by the receding river.

My pilot, "Old Pierre," an Indian pilot and *voyageur* of the old Hudson Bay Company, said that this log was a landmark in the days when this company transported their furs and merchandise up and down the river in bateaux. He says that the Indians always considered that the log was left there when the river was up at that height. This is one link in the chain of evidence that proves that at no distant date the Columbia was a stream of such magnificent proportions that the present river is a tiny rivulet compared with it. If this be the true explanation of the location of this log, it is a remarkable example of the preservation of wood for a long period of time. It may be that the log is petrified, but I had no means of getting at it to determine.

There are many other things which may be cited in proof that this river has but lately become reduced to its present size. All along up the river, wherever there is a concave portion of the bluffs, there we find terraces of from ten to five hundred feet in elevation above their neigh-

bor terraces below. These are all composed of rather loose soil, bowlders and gravel, and river sediment, and have well defined and sharp edges. These prove incontestibly the former grandeur of the river, and exist to a height of 2,000 feet or more above the present river, and their sharp and well-defined edges would seem to prove their newness in the scale of time.

The picture-writings at the upper end of Lake Chelan were in all probability made when this lake was a great arm of the greater prehistoric Columbia, and both were hundreds of feet above their present level.

A few miles below Victoria Rock we came to the mouth of the two coulées, which are presumably those of Moses Coulée and the coulée breaking in from the south of Badger Mountain, and which is commonly accepted as the continuation of the Grand Coulée.

In three or four miles further we come to Gualquil Rapids, which are about a quarter of a mile in length and form no obstruction, and then we had seven or eight miles of the most perfect river, and we went smoothly gliding along, with no sound but the monotonous rhythm of the oars to break the stillness. The bluffs have been getting lower and lower on both sides of the river, and the strata seem to slope down from the north, indicating an upheaval to the north or a subsidence to the south.

The terrace formation so prevalent further north, here has almost entirely disappeared.

After passing a small stream coming in from the right about two miles, we come to Island Rapids. A bar island obstructs the free flow of the water, and a little rapid is formed which is not at all bad.

About two miles below these rapids the country opens out on the west into a broad flat, with rolling hills to the rear, while the bluffs on the left bank keep getting lower and lower. Down over a good river we move along, and soon come to the Crab Creek Coulée, running along the northern side of Saddle Mountain. Crab Creek discharges no water into the Columbia—at this season of the year, at any rate.

Just below Crab Creek Coulée the high steep bluffs come down close to the river on both sides. On the left bank the bluff is the end of Saddle Mountain, on the right bank it is the commencement of a ridge extending off to the west.

To the south of these *Sentinel Bluffs* the country becomes flat, sandy, and uninteresting, elevated but a little above the river.

Saddle Mountain is a range of grass-covered hills, extending nearly due east, and terminating in the desert plains a few miles to the northeast of White Bluffs. Between it and the curve of the Columbia which swings around by Priest Rapids and White Bluffs the country is largely composed of sandy, gravelly, worthless soil. Some grass exists and some large areas of sage-brush, but what soil there is seems to be more alkaline and powdery than in other sections of the Columbia basin.

On the right bank, below the Sentinel Bluffs, the cliffs recede and a plateau lies along the river, which seems to be of poor quality and not well fitted for any purpose of agriculture. The hills back from the river appear more fertile, being covered with grass and appearing to have springs scattered along their brown sides.

For about five or six miles the river in this portion of its course is very sluggish, wide, and deep, and on the beautiful day during which we passed over it, it seemed to be more like a lake than a river. This dead water is evidently caused by the damming up by the obstructions below at Priest Rapids. The *first ripple* of the system of Priest Rapids is a slight one as far as the swiftness is concerned; the water, however, is shallow, flowing over immense bowlders and jagged rocks, which were plainly visible from the boat and at a variety of depths below the surface. Near the left bank many of these rocks come above the water, and the whirls told plainly that many others were just below the surface. Our course lay about the middle of the stream, and the sounding-pole would indicate one instant perhaps a depth of three or four feet, the next ten or twelve, and the next five or six. Through this portion of the river a steamer could go now in safety after finding and knowing thoroughly a good channel.

The *second rapid* is about as bad a place as there is on the whole river. All about, the bed-rock points and islands rise up in ugly, black, jagged masses, threatening destruction to anything that touches them. The bottom, as in the first ripple, is composed of huge bowlders and rocks, and the water flows swiftly over this dangerous bottom and these outcropping rocks with a depth of only three to four feet. The fall here is considerable; we passed over one fall of at least three feet.

A steamer could not ascend this rapid without the use of a line, and even then the greatest care would be necessary. A smooth stretch of quiet water then followed, and we came to the *third rapid*, which was swift and shallow, with considerable bed-rock jutting up near both shores. The bed of the river at this rapid is the same as it has been all along, composed of large bowlders.

For about five and a half miles now the river is quiet and slow, with rocks scattered about here and there, generally in clusters. The water is so shallow that we are able to see bottom for a great part of the way, and is from twelve to twenty feet in depth. The *fourth rapid* is in this stretch of water, but is very mild in character and presents no obstruction.

We now come to a very bad portion of the river, consisting of the three lower rapids of Priest Rapids. We are able to tell from the preparations made by old Pierre and his crew that something bad is coming, as well as by the roar that reaches our ears, and the black, rugged rocks that seem to extend nearly the entire way across the river.

We reach a point where a black-rock island lies toward the left bank, and a long, irregular mass stretches along near the right bank. This

lies along the *fifth rapid*, in which the water is very turbulent, boiling and roaring a great deal. This boiling and foaming is not, however, necessarily attended with great swiftness of current, for in this ripple we did not move as fast as in some others which appeared much more quiet. In fact, the tumbling over the uneven bottom which causes the agitation tends to check the velocity considerably.

The long, irregular mass near the right bank which lies along the fifth rapid continues on down the river for about two and a half miles, with only an occasional break.

A little below the fifth rapid we come to where the main channel is divided into two by another long, irregular, jagged mass of the same black basaltic rock, thrown along almost in the center of the river. We choose the right-hand channel of the two, and, after swiftly passing a few ugly-looking projecting points, we find ourselves in the *sixth rapid*, shooting with the speed of a race-horse down through the canal-like channel between these two long rock islands. For about a mile we tore along with the united speed of the raging torrent and our yelling Indian oarsmen. This channel seemed to have plenty of water, but is quite narrow, being about sixty to eighty feet wide. We went through it at the rate of about twenty miles an hour.

The left-hand channel is the one better suited to purposes of navigation, I believe. I did not examine it, but it has been examined by Captain Gore, of the Oregon Railway and Navigation Company, who informed me that he took a steamer up through it and brought it back. The little steamer Chelan was taken down through this channel in safety.

This left-hand channel is crookeder and the water is not so swift as in the straight-away one through which we came.

Emerging from the canal-like sixth rapid, old Pierre throws the boat to the left to avoid some bad-looking water dead ahead, and, after a little further tumbling and rolling about in the *seventh rapid*, we emerge with a shout of joy from the eleven miles of Priest Rapids. We all know now that our dangers are passed, and thank God for allowing us to safely come through all the rapids.

We soon make for shore, and camp on the right bank, having made during the day about fifty-eight miles.

At this point on the Columbia, at the lower end of Priest Rapids, must surely be located a town of considerable importance, as it will for a long time be the head of navigation on the river. It is the most convenient place from which to reach the Yakima and Kittitas valleys, which now communicate with the lower country by a wagon-road over the Simcoe Mountains to the Dalles. The rapids will furnish a splendid water-power, and in all probability here will be located flour and saw mills, as well as warehouses and stores. Logs can be brought down the Columbia to be here sawed into lumber and distributed to the surrounding agricultural regions. The rapids are centrally located for

many fine valleys and much promising country, and are easily reached by wagon-roads from many directions.

Along the lower portion of the river traversed this day the rise and fall of the water is much less than along any other portion of the river, judging by the line of drift-wood along the banks and the small elevation of the plains above the river.

On Saturday, October 8, we left our camp below Priest Rapids and pulled down the river. Very few objects of interest were to be seen. The country on each side is low, flat, and the soil appears sandy and unproductive. To the south the flat land extends away to the Yakima River. Our course during the forenoon lay nearly due east, and where the river again makes a great bend to the south we come to the well-known *White Bluffs*. The river makes a semicircular sweep to the north and cuts into the bluffs, leaving a very nearly vertical wall of from one hundred to six hundred feet in height. The rock is a sandy marl, soft and friable, which easily powders where the cattle have traveled over it in going up and down hill for food and water. We continue along under these bluffs for ten miles or more. There are a great many birds' nests, made of clay, attached to the bluffs, but the birds whose houses they were had all fled.

Numbers of cattle and some horses were seen which graze on the plateaus along the river, to which they come down for water. We passed during the day several camps of Indians engaged in salmon-fishing; in one camp were nineteen lodges. A little after eleven o'clock we passed the old military depot camp at White Bluffs, where the storehouses still stand.

During the day we made about fifty-seven miles. The river is all the way an almost perfect river for steamboating, the drawback being the bars and shifting channel along by White Bluffs ; but over these bars there seems to be a sufficiency of water for all purposes. We passed a great many bar islands, and encamped about six miles above the mouth of the Yakima.

The next day, Sunday, October 9, we left camp bright and early, and by ten o'clock reached the mouth of Snake River. The country along the river, with the exception of a small area near the mouth of the Yakima, is very poor; in fact, must be considered a desert. Back from the river, especially to the east, the soil is good, though light, and the only drawback to its successful cultivation is the lack of rains in the summer and the facility with which it becomes dry and powdery.

At a distance of nine miles above the mouth of the Snake River the Yakima comes into the Columbia from the west. It rises in several large and beautiful lakes in the Cascade Mountains, in about latitude 47° 30′, and, taking a general course to the southeast, runs for one hundred and sixty miles to its confluence with the Columbia. For twenty-five miles down the stream its valley is only from half a mile to a mile wide; it then widens out into Kittitas Valley, which is ten to fifteen miles wide,

the river there being ninety feet wide and about three feet deep, and very rapid.

Below this valley the river curves gradually to the south until it receives the waters of the Pisko, then it turns again to the eastward, in which course it continues to its mouth. Between the Kittitas and Atahnam the hills again encroach on the valley, but below that it widens out again to from six to ten miles, with numerous branchings among the hills. On the west side, opposite Kittitas plain, these small streams rise among the hills separating the main Yakima from its principal branch, the Nachess. These streams are from fifteen to twenty miles long and run through small and fertile valleys. The Nachess rises in the vicinity of the Nachess Pass, and running nearly parallel with the Yakima at a distance of fifteen or twenty miles, joins it after flowing about fifty miles. It has a valley from half a mile to four miles in width. The Atahnam rises about thirty miles south of it and runs in a more easterly course, emptying into the Yakima about ten miles below; its valley is smaller than that of the Nachess, but fertile. The Pisko resembles the Atahnam. The Yakima is not navigable for boats of any kind.

About its headwaters there is much good timber, and it furnishes a natural waterway to get it out to the Columbia. This is, however, attended with great difficulty, owing to the fact that the river in the lower parts of its course spreads out and becomes very shallow. It is only when at its very highest that there is sufficient water to float logs, and this high water only lasts a few days. If advantage is taken of it, logs can be brought down; if not, they will lodge and remain fast on the river bars. This has proved a great source of delay, loss, and inconvenience to those engaged in getting out timber for the Northern Pacific Railroad.

The town of Ainsworth is situated on the right bank of the Snake River, about a half-mile above its mouth.

It is at this point that the Northern Pacific Railroad crosses the Snake, and here are the company offices of the railroad division, built in the midst of a bleak, dreary waste, in which for many miles around sage-brush and sand predominate. Ainsworth is one of the most uncomfortable, abominable places in America to live in. You scan the horizon in vain for a tree or anything resembling one. The heat through the summer is excessive, and high winds prevail and blow the sands about and into everything. By the glare of the sun and the flying sands one's eyes are in a continual state of winking, blinking, and torment, if nothing more serious results. Captains Lewis and Clarke found the Indians of this country very much afflicted with sore eyes, which they ascribe to the glare of the sun on the desert and rivers and the prevailing sand-bearing winds. It is interesting to know that they took advantage of the fact and procured plenty of horses and provisions from the Indians in exchange for the surgical operations which they performed and the

medicines which they gave the Indians, especially the much-desired and needed eye-water, from which their patients found great relief. Their journal says:

> We were by no means dissatisfied at this new resource for obtaining subsistence, as the Indians would give us no provisions without merchandise, and our stock was now very much reduced. We cautiously abstained from giving any but harmless medicines, and as we could not possibly do harm, our prescriptions, though unsanctioned by the faculty, might be useful, and were therefore entitled to some remuneration.

It was only by utilizing this source of revenue, after their stock in trade was exhausted, that the distinguished explorers were enabled to make their way back to the regions of civilization.

The railroad terminus across the river from Ainsworth was named, and for some time bore, the appropriate name of *Hades*, but some of the higher authorities condemned the name, and substituted therefor South Ainsworth.

We drew our boat upon the bank, put the oars in her, and abandoned her. The Indians were very much interested in everything about the place, and I explained things to them as well as I could. I paid them off, gave them tickets back to Colville, and each a letter of recommendation, and Mr. Downing and I gave them all our extra clothing, and they seemed supremely happy. Old Pierre made sundry visits to a whisky saloon, but promised not to get drunk until he returned to Colville where he said he would have two good drunks and then stop. The other Indians did not seem to have any inclination to drink. I cannot praise them too highly for their skill, their uniform good-nature, honesty, endurance, and sobriety. I think it would be very difficult to pick up at a few hours' notice four white men who would row a heavy boat through dangerous rapids for four hundred miles without wanting strong drink, or be able to withstand, after being paid off, the temptations of drinking-saloons.

Thus our journey down the river ended. We left the Indians to pursue next day their way back to Colville, and that night Mr. Downing and I took the cars and safely arrived at Vancouver the next day.

CHAPTER V.

TABLE OF DISTANCES ON THE COLUMBIA RIVER.

In computing the following table of distances I have made use of the distance tables of the Oregon Railway and Navigation Company in determining the distances from the mouth of the Columbia to Snake River; from this point the distances are those determined on my recent survey of the river and platted on the accompanying maps.

I have only given the important points up as far as Snake River.

The first column of figures gives the distances between the consecutive points named; the second column gives the total distance of the

point named from the mouth of the Columbia River; the third column gives the total distance of the point named from the Boundary line; and the fourth column of figures gives the total distance of the point named from the mouth of the Snake River, both down and up the Columbia.

It will be seen by comparing my distances with those of Captain Pingstone, whose report on the river is partially given herewith, that they do not agree, his distances being generally much greater than those given in my table. The distances here given were taken with the greatest care from point to point, and the whole was platted and fitted very closely between the known positions of the boundary and the mouth of the Snake:

	Distance apart.	Distance from mouth of Columbia River.	Distance from Boundary line.	Distance from mouth of Snake River.	Remarks.
Mouth Columbia River	.....	.....	752	336	
Astoria	10	10	742	326	
Kalama	68	78	674	258	
Mouth Willamette	30	108	644	228	
Vancouver	6	114	638	222	
Lower Cascades	45	159	593	177	
Upper Cascades	6	165	587	171	
Hood River	18	183	569	153	
The Dales (city)	23	206	546	130	
Celilo, at head of Dalles	14	220	532	116	
Umatilla	82	302	450	34	
Wallula	23	325	427	11	
Snake River (Ainsworth)	11	336	416	0	Northern Pacific Railroad crossing.
Mouth Yakima River	9	345	407	9	
Foot of Long Island	23	368	384	32	
Head of Long Island	4	372	380	36	
Old White Bluffs Depot	10	382	370	46	Road from here to old Camp Chelan and to Spokane Falls.
End of White Bluffs	5	387	365	51	
Ferry across Columbia	22	409	343	73	Road from here to Kittitas Valley and to Yakima.
Priest Rapids:					
Seventh Rapid	.5	409.5	342.5	73.5	
Head Sixth Rapid	1.5	411	341	75	
Fifth Rapid	1	412	340	76	
Fourth Rapid	4	416	336	80	
Third Rapid	1	417	335	81	
Second Rapid	2.5	419.5	332.5	83.5	
First Rapid	1.5	421	331	85	
Sentinel Bluffs	4.5	425.5	326.5	89.5	
Mouth Crab Creek Coulée	1	426.5	325.5	90.5	
Bar Island, upper	6.5	433	319	97	
Island Rapids	4	437	315	101	
Gualquil Rapids	10	447	305	111	Called also Eagle Rapids.
Lodgestick Bluff	4.5	451.5	300.5	115.5	

	Distance apart.	Distance from mouth of Columbia River.	Distance from Boundary line.	Distance from mouth of Snake River.	Remarks.
Mouth Grand Coulée	4	455. 5	296. 5	119. 5	
Mouth Moses Coulée	1	456. 5	295. 5	120. 5	
Victoria Rock	5	461. 5	290. 5	125. 5	
CABINET RAPIDS	2	463. 5	288. 5	127. 5	
Rapid	3	466. 5	285. 5	130. 5	
ROCK ISLAND RAPIDS					Called also "Osé de Pierre Rapids," Isle de Pierre Rapids and Buckland's Rapids.
Foot	1	467. 5	284. 5	131. 5	
Head	1. 5	469	283	133	
Bishop's Rock	6. 5	475. 5	276. 5	139. 5	
Com. of Rock Islands and Rapids	1	476. 5	275. 5	140. 5	
Road to Kittitas leaves river	1. 5	478	274	142	
Rapid below Wenatchee flats	4. 5	482. 5	269. 5	146. 5	
Wenatchee River	2	484. 5	267. 5	148. 5	Bad bar and gravel flats just below mouth, Miller's Store and Ranch.
Rocky Bar	6	490. 5	261. 5	154. 5	
Longview Point	2	492. 5	259. 5	156. 5	
Rapid below Enti-at-qua Bar	5. 5	498	254	162	
Enti-at-qua River	2	500	252	164	
Ribbon Bluff	7. 5	507. 5	244. 5	171. 5	
Bar and Rapid	8	515. 5	236. 5	179. 5	
Rapid	2	517. 5	234. 5	181. 5	
Downing's Rapid	4	521. 5	230. 5	185. 5	
Chelan River	1. 5	523	229	187	
Chelan Crossing, Indian village	1	524	228	188	Old crossing for Camp Chelan, Indian Ferry.
Rapid	4. 5	528. 5	223. 5	192. 5	
Rapid	7. 5	536	216	200	
Lower end Methow Rapids	3. 5	539. 5	212. 5	203. 5	Called also Ross Rapids.
Methow River	1. 5	541	211	205	
Bar	6	547	205	211	
OKINAKANE RIVER	2	549	203	213	
Foster Creek	9	558	194	222	
FOSTER CREEK RAPIDS	1	559	193	223	
Rapids	2	561	191	225	
Rapid	3	564	188	228	
End Short Rapids	2	566	186	230	
Commencement Short Rapids	1. 5	567. 5	184. 5	231. 5	Rapids 1½ miles long.
End of Long Rapids	2	569. 5	182. 5	233. 5	Rapids 4 miles long.
KALICHEN FALLS AND WHIRLPOOL RAPIDS	1	570. 5	181. 5	234. 5	
Commencement Long Rapids	1	571. 5	180. 5	235. 5	
Rapid	1	572. 5	179. 5	236. 5	
Rapid	3. 5	576	176	240	
Rapid	1	577	175	241	
Rapid	1	578	174	242	
Rapid	2. 5	580. 5	171. 5	244. 5	
MAH-KIN RAPIDS	1. 5	582	170	246	Called also Cannon Rapids.

	Distance apart.	Distance from mouth of Columbia River.	Distance from Boundary line.	Distance from mouth of Snake River.	Remarks.
Nespilem River	8	590	162	254	
Equilibrium Rapids	3	593	159	257	
Monaghan's Rapids	2. 5	595. 5	156. 5	259. 5	
Strong Rapid	4. 5	600	152	264	
Rapid	3	603	149	267	
Grand Coulée	2	605	147	269	
Ne-ah-kwa Creek	7	612	140	276	
Mammoth Spring	7	619	133	283	
Sans Poil River	2. 5	621. 5	130. 5	285. 5	
HELL GATE	4	625. 5	126. 5	289. 5	
Friedlander's Store	2	627. 5	124. 5	291. 5	Road to the South.
Whitestone and Whitestone Creek	2	629. 5	122. 5	293. 5	
Castle Cove	5	634. 5	117. 5	298. 5	
Welsh Creek	4. 5	639	113	303	
Hawk Creek; "Virginia Bill's"	1. 5	640. 5	111. 5	304. 5	Excellent road to the south.
China Camp on Island	2. 5	643	109	307	
SPOKANE RIVER	2. 5	645. 5	106. 5	309. 5	
SPOKANE RAPIDS	0. 5	646	106	310	
Mitre Rock	4	650	102	314	
Camp Creek	4	654	98	318	
Deer Creek	1	655	97	319	
Rapid	1	656	96	320	
Ik-ke-lux-tum Creek	3	659	93	323	
Elbow Bend, Black Island Rapids	2	661	91	325	
Rapid	2	663	89	327	
Rogers Bar	2. 5	665. 5	86. 5	329. 5	
Rapid	1	666. 5	85. 5	330. 5	
Ne-al-me-chin Creek	2	668. 5	83. 5	332. 5	
Rapids, big jutting rock (left bank)	3. 5	672	80	336	
Turtle Rapids	3	675	77	339	
En-el-cost-em Creek	7	682	70	346	
En-cha-lay-em Creek	1	683	69	347	
Rock Island and Bar near (right b'k)	1. 5	684. 5	67. 5	348. 5	
Charley Francais Bar	2	686. 5	65. 5	350. 5	
Sans Poil Indian Settlement and Bar	2	688. 5	63. 5	352. 5	
En-qua-shay-em Creek	3	691. 5	60. 5	355. 5	
Tch-ka-ka-wick's house	4. 5	696	56	360	
Driftwood Rock Island	2. 5	698. 5	53. 5	362. 5	Rapid.
RICKEY'S LANDING	3	701. 5	50. 5	365. 5	
GRAND RAPIDS	2. 5	704	48	368	
Mouth Colville River	3	707	45	371	
KETTLE FALLS	4	711	41	375	
Kettle River	2	713	39	377	
Old Fort Colville	1	714	38	378	
Six-Mile Bar	6	720	32	384	
Twelve-Mile Bar	6	726	26	390	
Little Dalles	11	737	15	401	
BOUNDARY LINE	15	752	0	416	

To this I add the following distances derived from the works of Alexander Ross and others:

	Distance apart.	Distance from mouth of Columbia River.	Distance from boundary line.	Distance from Snake River.	Remarks.
BOUNDARY LINE	.....	752	.....	416	
Pend d'Oreille River	1	753	1	417	
Kootenay River	24	777	25	441	
Lower Arrow Lake	12	789	37	453	South end.
Do	42	831	79	495	North end.
Upper Arrow Lake	16	847	95	511	South end.
Do	33	880	128	544	North end.
Little Narrows or Dalles	37	917	165	581	
City of Rocks	22	939	187	603	
Dalles des Morts	23	962	210	626	
Boat Encampment	70	1,032	280	696	Canoe River and Portage River.

CHAPTER VI.

NAVIGATION OF THE COLUMBIA RIVER.

From its mouth to the mouth of the Willamette, the Columbia is navigated by ocean steamers, sea-going ships, and river craft of all kinds.

From the Willamette up to the Cascades, river boats find abundant water and go freely at all seasons of the year except when the river freezes up, which happens generally each winter. The freeze-ups on this portion of the river last but a short time, however.

At the Cascades the obstruction to navigation is complete. Boats cannot ascend the rapids at all, and they cannot descend with any degree of safety. Here, in order to render the river navigable, means must be adopted to pass boats both up and down over the rapids. A canal with locks has been adopted as the means to do this, and work has progressed on it for several years. When this is completed navigation will be continuous up to the Dalles. This will throw the river open to all who wish to navigate it, and a healthy competition will be the result for all the trade centering on the river at and below the Dalles.

The Dalles is another complete and total obstruction to navigation. Boats can neither go up nor down them, and in consequence means must also be adopted here to pass them both up and down, if complete river navigation is proposed. Surveys have been made and plans and estimates are now being prepared for the desired improvement here.

With these two serious obstacles removed, there would be continuous navigation to Priest Rapids, a distance of 409 miles from the sea, and by the Snake River to the Grande Ronde River, 30 miles above Lewiston, a distance of 516 miles from the sea, making a total of navigable

water of 589 miles. To this must be added the navigable waters of the Clearwater, the extent of which I do not know.

This would throw open to competition the river transportation demanded by the great grain belt between the Cascades and the Bitter Root Mountains, south of the forty-seventh parallel.

By no other means could the government confer a more decided and lasting benefit upon the people of this great section than by removing the obstructions to navigation at the Cascades and Dalles.

The portions of the river at present regularly navigated by river steamers are those below the Cascades to the mouth of the river; between the Cascades and the Dalles; and from Celilo, above the Dalles, to the mouth of the Snake River, on the Columbia; and up the Snake to Lewiston. Once in a while a steamer makes a trip to Priest Rapids, but the business is not sufficient at present to cause one to be sent with any regularity. The Columbia, from the mouth of the Snake to Priest Rapids, is excellent for the purpose of navigation and will never need any improvement, in all probability.

If Priest Rapids could be improved it would give navigation thence to Cabinet Rapids, a few miles below Rock Island Rapids. The consequence of throwing this portion of the river into the prospective continuously navigable river below will be readily seen by a study of the map. The splendid valley of the Kittitas and Upper Yakima would have an easy and short outlet to the navigable river. I have never been in this portion of the country, but am assured by those who have that a great amount of fine land exists there.

On the other side of the river the fine country composing Badger Mountain would be benefited, and would be settled and its produce taken to tidewater by the river boats.

The amount of country to the west of the river which would be benefited by the improvement of Priest Rapids is about thirteen hundred square miles, of which a large portion is arable and grazing land of excellent quality. On the east of the river there is an area of about four hundred square miles, a great part of which is the finest quality of agricultural land. This of course is the area to be directly benefited; indirectly, all the country up the river would be benefited, as well as all the portions below which will need lumber and fuel, readily obtainable in the region of the Upper Yakima and Wenatchee.

CABINET AND ROCK ISLAND RAPIDS.

A distance of about forty-two miles of navigable water lies between the head of Priest Rapids and the foot of Cabinet Rapids. This portion of the river, if it ever becomes well known, will be celebrated for its beauty and grandeur. Out of the same materials as those which compose the "Giants' Causeway" of Ireland, nature has formed and decorated this locality.

In any scheme for the improvement of the navigation of the river

Cabinet Rapids and Rock Island Rapids must be considered together, as they lie only about four miles apart.

Above Rock Island Rapids there is a stretch of ninety miles of navigable water to Foster Creek Rapids, ten miles above the Okinakane. In this section of the river there are some portions where rocks are plenty and waters swift and strong; they can, however, be avoided and overcome by a moderate amount of care, a sufficiency of power, and skillful navigation.

There are four bars in this portion of the river, of which one, about two miles below the Okinakane, and another about eight miles below Chelan, have undoubtedly a sufficiency of water for all purposes. The Wenatchee and Enti-at-qua bars are worse, and it will be well to determine accurately the depth of water on them at the lowest navigable stage, and build steamers to correspond thereto.

My observation did not extend over the entire water-course at either place, and I cannot tell positively the general depth that could be taken over. I believe, however, that, on the Enti-at-qua bar especially, a steamer drawing more than three feet would have serious difficulty in getting over at low-water.

If it is deemed desirable to have steamers on the river drawing more water than there is on these bars it will be easy and inexpensive to dredge out a channel of sufficient depth, and it might be that a simple improvement in the form of a wing-dam would cause the river itself to keep a channel of sufficient depth cut through. At all ordinary stages, however, there would be plenty of water for the class of boats likely to run on the river for many years to come.

We can therefore safely conclude that with Priest Rapids and Cabinet and Rock Island Rapids rendered navigable, the Columbia would be passable for river steamers to Foster Creek Rapids, a distance from its mouth of 559 miles. Let us consider what country would be benefited thereby.

First would be the Wenatchee country, which is splendid in quality and of considerable extent. The fine flat of about twenty-five square miles near the mouth is all that I can speak of with certainty, but undoubtedly up the river are other valleys suitable for agriculture, and a great amount of fine grazing land. The timber in the Wenatchee Mountains and in the whole region of timbered mountains west of the Columbia River will be valuable, and the whole interior country will be benefited by any plan which will assist in giving it easy and cheap transportation to those sections where it is needed.

Second. About the mouth of the Enti-at-qua the amount of arable land is not great; as to what may be in the interior, I am unable to tell.

Third. About Lake Chelan there is a great deal of good agricultural land in the form of open prairies, bunch-grass-covered hills, and rich, rolling timbered country. The lake will furnish the means of getting at a large amount of valuable timber which exists along its banks.

Fourth. About the upper branches of the Methow there is a consider-

able extent of good agricultural and grazing land. The lower portion of the Methow flows through a range of wooded hills and is hemmed in closely by them; further up, these hills become more rolling and grassy, and the banks of the streams are bordered by level and wide terraces of excellent soil. Throughout this large territory of 4,675 square miles, now set apart for Chief Moses and his people, there are many fine valleys and agricultural hills which would be benefited by an open river.

Fifth. The magnificent country bordering upon and tributary to the Okinakane would be immensely benefited by an open, through river navigation. I have already described, as far as I could, the country in the vicinity of the Okinakane, and will not do so again here.

Sixth. All that portion of the Great Plain of the Columbia lying between the river and the Grand Coulée and Badger Mountains would be benefited by the improvement. This region is at present unsettled and far away from market, but it is a fine agricultural section and will have a large population some day.

The amount of country which would receive a direct benefit from the improvement of Rock Island and Cabinet Rapids, assuming, of course, the removal of all obstructions, and a free and open river below, would be about as follows, the areas given being, as near as possible, the agricultural and choice grazing lands:

	Square miles.
Vicinity of Wenatchee and Enti-at-qua	120
Vicinity of Lake Chelan	100
Vicinity of Methow	500
Vicinity of Okinakane	1,120
Great Plain, west of Grand and Moses Coulées	980
Total	2,820

The indirect benefits to the whole country east of the mountains would be very great, as it would insure the easy and cheap transportation to the grain belts about Walla-Walla and the Lower Snake and Columbia of the wood and lumber abounding about Lake Chelan, the Wenatchee, Methow, Okinakane, and other streams. This commerce in lumber will certainly be of great importance. Besides the commercial interests involved in the raising and shipment of grain, cattle, wool, lumber, &c., other interests of great importance are apt to be created as the country is examined, if mines of the precious metals, iron, coal, &c., are discovered and developed.

I come next to consider the benefits which would arise if the river from Foster Creek Rapids to the Mahkin Rapids was improved so as to allow boats to pass freely from the good river below to the good river above and *vice versa*. In order to consider this properly it is necessary to go ahead a little and take a look at Hell Gate and the Spokane Rapids, the only other obstructions worthy of mention below Grand Rapids near the mouth of the Colville River.

Until proved to the contrary I shall consider that Hell Gate is navi-

gable both up and down for steamers. If it is proved to be too swift for boats to ascend, then some method must be adopted for its improvement which can be considered further on.

Acknowledging that Hell Gate is navigable, we come to the Spokane Rapids, which are not navigable, except by a steamer using a line. They are short and the waters have a considerable fall; but as I have previously said, they can be rendered passable at a small expense by removing the bowlders and rocks which clog the channel and are the cause of the rapids. An expenditure of $20,000 would, I believe, effectually improve this bad place and render it easily navigable at all stages of water. In the mean time, until their improvement shall be completed, any boats engaged in commerce on the river can line over the rapid safely, as the channel has plenty of depth and is straight.

This portion of the river then from Mahkin to Grand Rapids, a distance of one hundred and twenty-two miles, must be considered as navigable, since the only obstructions in it are of such a temporary nature.

If, then, we assume that the river from Foster Creek Rapids to Mahkin Rapids be improved to allow the passage of boats, we see that it will open up the river to Grand Rapids, and all the country tributary to the river up to this point will be directly benefited by the improvement. About a good deal of this country very little is known, but judging from what I do know and have been told, and from the general appearance of the country as seen from a distance, I think that a fair estimate of the good productive land (arable and grazing) which by means of the river improvement would be brought into direct river communication with tide-water is as follows:

	Square miles.
Vicinity of Nespilem River	360
Vicinity of Sans Poil River	540
Immediate vicinity of Columbia River	1,020
Vicinity of Colville River	600
Vicinity of Spokane River	200
Great Plain south of Spokane and Columbia	2,400
Total	5,120

It is scarcely worth while for me to enlarge on the general benefit to the whole North Columbian Basin, which would be conferred by removing all the obstructions and giving through river navigation from Grand Rapids to the sea.

The continued, earnest, and united efforts of other countries and sections to obtain water transportation to the seaboard by means of rivers and canals, sufficiently attest the estimation in which it is held by the people, and its value and importance are clearly shown by all the navigable rivers and internal water routes of the world.

The Government of the United States has commenced the improvement of the Columbia at the first obstruction, the Cascades; it has

taken the preliminary steps toward the improvement at the Dalles, and it will ere long be called upon to commence the improvement at Priest Rapids and the upper rapids to give a continuously navigable river.

If we take a glance forward to the time when all this eastern portion of Washington Territory shall be settled, when the whole land shall be a waving field of grain, with here and there a village or a city; with railroads traversing the country in every direction, and a vast commerce being carried on between the sea and the interior; if we picture to ourselves all this with the Columbia in its present state of interrupted navigability, and then picture it with the river completely navigable from the Grand Rapids to its mouth, we shall be able in some degree to appreciate the importance of undertaking and completing the great works of improvement needed on the river.

In considering the amelioration of the river from Grand Rapids to its mouth, we can divide the rapids which form obstructions to navigation into two classes: *first*, those which do not admit the passage of steamers either in ascending or descending the river, and cannot be made to admit this passage by any work upon the rapids themselves; and, *second*, those which, while forbidding the passage of steamers in ascending, permit them to descend in safety or can be made to permit the downward passage by work on the rapids themselves.

The Dalles, the Cascades, Grand Rapids, and Kettle Falls belong to the first class; all the other bad rapids belong to the second class.

Priest, Cabinet, Rock Island, and the Nespilem rapids all permit or can readily be made to permit the downward passage of steamers. If, then, we suppose that a loaded steamer engaged in river commerce can start at Grand Rapids and safely descend the river to the Dalles, and by means of improvements here and at the Cascades, to the river's mouth, the problem simplifies itself into adopting some system of improvement to permit this steamer with its load to ascend the river.

Passing up from the Cascades and Dalles, the first obstacle which presents itself is Priest Rapids.

IMPROVEMENT OF PRIEST RAPIDS.

The proper plan for improving these rapids must be determined by further surveys and observations extending over a greater length of time than I could devote to them. The lower system of rapids, consisting of the fifth, sixth, and seventh, are close together, and connected with the upper system of the first, second, third, and fourth rapids by a good quiet stretch of river.

I thought while in the vicinity of the rapids that perhaps this lower system might be improved and rendered sufficiently navigable by working upon the bed-rock and bowlders in the river, blasting and clearing away a properly laid-out channel; further reflection, however, induces me to be cautious about expressing such an opinion. Captain Gora, com-

manding one of the Oregon Railway and Navigation Company steamers, told me that he went with his steamer up through this system into the good water beyond, and turned around and came back, keeping the channel near the left bank. His trip was made when the water was at a low stage and with an unloaded boat.

If the improvement could be effected by this means the cost would not be great. It may be that the upper system of rapids can be improved by the method of blasting and clearing out the river. Above the rapids there is a long stretch of very quiet, deep water, which will bear lowering and quickening a great deal, sufficiently to enable the river to assume a navigable slope down to the middle good water. If the river from the mouth of Crab Creek Coulée to a point a few miles below the rapids could be regularized, it would undoubtedly be navigable.

If, however, when the proper detailed surveys have been made and experiments conducted, it is found, as I believe it will be, that it is not practicable to improve the bed of the river sufficiently to give good navigation, then some other means must be adopted.

The best means to adopt for this purpose I conceive to be a railway, over which boats can be transported from the foot of the rapids to the head.

I would advocate a railway in preference to a canal and locks, on the ground of expense. The cost of the construction of a railway and its adjuncts would probably be not more than from one-sixth to one-fourth of the cost of a canal about Priest Rapids, and its operating expenses would not be very much greater. About the Nespilem Rapids, from Foster Creek to Mahkin Rapids, the cost of a canal with locks would be so great as to render it entirely out of the question to build it or even to contemplate building it; while the cost of a railway would be a reasonable sum proportionable to the benefits to be derived from it, and would answer every purpose of a canal.

Steamboats can certainly go down Priest Rapids safely if under steam and with sound steering-apparatus. To give entire safety and avoid as far as possible all risks, it might and probably would be found necessary to remove some rocks from the channel. The expense of doing this would be slight.

The conformation of the ground is peculiarly favorable for the construction of a railway. It is, along the left bank, a level plain of solid soil, largely composed of bowlders and gravel, at a slight elevation, probably not more than forty feet above the river. As the river is navigable for boats bound down, the railway would have for its end only the taking of boats up stream, and, in consequence, the construction and operation would be very simple. It probably would not take more than a quarter to a third of the time to build a railway that it would a canal, and once well built the railway could be maintained and kept in order as cheaply as the canal.

While it is very far from my intention to give a detailed plan for a

railway for transporting river boats around the rapids of the Columbia River, yet I wish to give a very general outline of such a plan.

Just below the foot of the rapids an inclined track could run down into deep water. A carriage, or car, with its top shaped to receive the bottom of the boat, could be run down on this track into the deep water and the boat received in it.

A stationary engine could take the carriage and boat up the incline to a summit point sufficiently high to give a slight down grade to the deep water at the head of the rapids. At the summit the vertical direction could be changed, and a locomotive could take the carriage and boat down to the head of the rapids, and bring back the carriage. At Priest Rapids the course of the railway could be perfectly straight, obviating any necessity for a horizontal change of direction. The time which would be occupied in making the portage need not exceed two hours at the most, and by having several carriages the process of taking one boat up the incline could go on coincidently with the transportation of another to the head of the rapids, so that, with everything working well, it may be safely estimated that a boat could be taken over every hour with a single track. This would accommodate the river commerce for many years to come, and if it ever became necessary the facilities for transporting boats could be indefinitely increased by building a double track for the return of the carriage, and adding the necessary improvements to the plant.

The class of boats which it will be found most advantageous to run on the Upper Columbia will probably be found to be similar to those now run on the Snake River, and of which the Spokane, Annie Faxon, and Almota are types. The Annie Faxon, the largest of these, is 165 feet long, 37 feet beam, 5 feet depth of hold, and has a measured tonnage of 709 tons.

If we suppose a boat with her load having a displacement of 800 tons, which is probably the largest boat that would demand transportation, the carriage or car on which to transport her must weigh about 100 tons. This 900 tons is the weight to be transported and handled on the railroad. Once up the incline it can readily be handled by a good freight locomotive on a properly constructed track. This would be much more than would ordinarily be taken over, as most of the freight would be down river, and boats would be lightly laden going up stream.

Another very favorable circumstance which would facilitate the operation of a boat railway about Priest Rapids is the very small rise and fall of the river here. I cannot say what the difference between high and low water is, but it is very much less than at most other points on the river, and probably not more than eighteen to twenty feet.

If a canal should be decided on instead of a railway, the route would be the same, along the left bank. The same may be said of an ordinary portage railway for the transfer of freight, &c., from boats at one end to boats at the other end of the rapids.

IMPROVEMENT OF CABINET AND ROCK ISLAND RAPIDS.

Once the river at these rapids is well known to an experienced and skillful steamboat captain, he can take his boat down through both with entire safety, if she be under good headway and with sound and efficient steering apparatus. Of this I have no doubt.

At the stage of water which existed when I passed through, it seemed to me that a good, powerful steamer, lightly loaded, could ascend through both. However, at the best these rapids are not to be considered navigable in their present condition, for ordinary boats heavily loaded could not ascend. Cabinet Rapids can be very much improved; sufficiently so, I believe, by removing some of the rocks which jut out from the left bank and rise from the water towards this bank. There is a stretch of quiet water above these rapids which would allow of being quickened by the removal of these damming rocks.

The removal of 8,000 cubic yards of rock at a cost of about $7.50 per yard, making an expense of $60,000, would be sufficient for the purpose, I believe, and give satisfactory navigation up to the foot of Rock Island Rapids.

Rock Island Rapids are so situated and formed that a steamer, in going up, could take advantage of many eddies, and work her way up by crossing over the ripples from one side to another. There are some sunken rocks and jutting points which might interfere with this, and which should be removed. A careful study of the rapids and experiments with a steamer would determine which of these rocks and points it would be well and necessary to remove, and whether the navigation could be made satisfactory by such means. There is this to be said: for a number of years, until the country becomes well settled, the river transportation demanded will be small in amount, and any expedient which will give passable transportation over these rapids will be of great value in settling the country above.

The final and complete improvement of Rock Island Rapids will undoubtedly require that either a canal or a railway shall be constructed to allow the passage of boats from below to above the rapids.

As at Priest Rapids, so here, I should advocate the construction of a railway, and for the same reasons. To go around Rock Island Rapids proper, a railway would require to be about two and a half miles long and to change direction once, both vertically and horizontally. If Cabinet Rapids cannot be sufficiently improved by working on the rocks of its bed, the railway must be extended down to include them. In this case the railway would be about six miles long, and would not need to change its direction horizontally.

The conformation of the ground is well suited for the construction of a railway. At Rock Island Rapids the right bank of the river rises about one hundred feet to a nearly level plateau, which extends down almost to Cabinet Rapids. In the materials of this plateau the bed of

the railway would be easily made, and would be solid and enduring. The plateau widens out considerably at Rock Island Rapids, and extends for about three miles above.

IMPROVEMENT OF THE NESPILEM RAPIDS.

The improvement of the Columbia River from Foster Creek to Mahkin Rapids, the whole system being known as the Nespilem Rapids, is next to be considered. After traversing this portion of the river I came to the conclusion, at first, that it was so bad, and the bad portion so extensive, that its amelioration would be so expensive that the benefits to be derived therefrom would not justify the work. Further reflection however, and study of the country, the river, and methods of improvement, convince me to the contrary, and I thoroughly believe that means can be adopted at a reasonable expense which will permit the passage of boats up and down the river, and that the requirements of commerce will in the future demand and insure its being done.

In this stretch of about twenty-four miles, there are fourteen distinct ripples, some of them a mile or more in length. How much of this stretch can be made navigable for upward-bound boats by work on the river-bed it is impossible for me to say. Probably a considerable portion of it could be. Many of the rapids and ripples are caused by an accumulation of great rocks in the river brought there by ice transportation, and the removal of these would have a very great effect on the current. While I believe that it would be dangerous for a steamboat to run these Nespilem Rapids, yet I believe at the same time that by the removal of some obnoxious rocks and points, and the acquiring of a thorough knowledge of the river, its currents, channels, eddies, &c., it could be done with entire safety, provided no accident occurred on the steamboat itself. I see no reason why good steamers, with careful and experienced captains, cannot make a business of running down through these rapids.

Careful surveys, observations, and experiments could determine which of the rapids can be made to permit the ascent of boats; about the others, boat railways, similar to those proposed for Priest and Rock Island Rapids, can be built.

By a well-considered system of river improvement, and boat railways, I think that the passage of the Nespilem Rapids can be successfully accomplished.

A railway would probably be necessary about Foster Creek Rapids, about the Long Rapids, embracing Kalichen Falls and Whirlpool Rapids, and possibly about Mahkin Rapids, three in all. The first would be about two and a half miles long, the second about four and a half, and the last two miles long.

At the Foster Creek Rapids the ground is favorable for any kind of construction, and a railway would be easily built. At the other places the ground is not favorable, and the construction would be difficult and

expensive in comparison to what it would be at any other place where the railway would be needed. It would be still more unfavorable for any kind of canal construction.

To summarize then, the system of improvements that I would advocate to give continuous navigation from Grand Rapids to the mouth of the Columbia River is as follows:

First. The improvement required at the Spokane Rapids, the expense of which would be slight.

Second. A combined system of river improvement and boat railways at the Nespilem Rapids.

Third. A boat railway at Rock Island Rapids, and the improvement of the river at Cabinet Rapids.

Fourth. The construction of a boat railway around Priest Rapids.

Fifth and sixth. The construction of a canal with locks about the Dalles and the Cascades.

The following approximate estimate of the cost of the improvements above the mouth of Snake River is given:

Boat railway around Priest Rapids	$600,000
Boat railway around Rock Island Rapids	400,000
Boat railway around Foster Creek Rapids	400,000
Boat railway around Kalichen Falls, &c	800,000
Boat railway around Mahkin Rapids	500,000
	$2,700,000
Improvement of the river at Priest Rapids	50,000
Improvement of the river at Cabinet Rapids	60,000
Improvement of the river at Rock Island Rapids	25,000
Improvement of the river at Nespilem Rapids	150,000
Improvement of the river at Spokane Rapids	20,000
Total	$3,005,000

In view of the probability or at least possibility of the government, at some future time, undertaking the improvements mentioned, it would seem to be a wise step to secure now the lands which would be needed for the railways and works.

The lands are, I believe, unsurveyed, and strips could be set aside and reserved from sale for the purposes of improvement without cost to the government or hardship to any private individual.

Whatever system of improvement be adopted it would be necessary to have these lands, and I would suggest that proper steps be taken to reserve them.

Besides the method of taking boats up around the rapids by railway, other methods and combinations of methods may be found when the attention of engineers is thoughtfully directed thereto. It is highly probable that in some localities, perhaps in all, a system of warping lines can be arranged which will enable the boats to surmount the most rapid portions of the current, their own power taking them over all the intermediary water between the successive ripples.

A boat provided with a good steam capstan or drum could make fast to a fixed warping line or lines and work herself up over the rapids; or the line could be worked by a steam engine and drum on shore at the head of the rapids, thus giving the boat having hold of the line the additional power required.

Rock Island Rapids, portions of the Nespilem Rapids, and Hell Gate would seem to be well situated for this method of navigation, owing to the favorable conformation of the shores and islands.

There would of course be danger to the boats if the lines should break, but this danger could be very largely guarded against by using strong and specially prepared cables of steel or iron wire, by having facilities for disengaging the cable instantly, by keeping up steam, being thoroughly acquainted with the river, and knowing exactly what to do in case of accident at any point in the transit.

This would be very much less expensive than the boat-railway system, if it could be made practicable.

I am thoroughly convinced that skillful engineers will find some method or methods for giving satisfactory navigation throughout nearly the whole course of the Columbia within our borders, when the time comes that it shall be demanded.

GRAND RAPIDS, KETTLE FALLS, AND LITTLE DALLES.

Grand Rapids and Kettle Falls taken together form an obstruction to the navigation of the river which it cannot be hoped will ever be overcome. There does not seem to be any probability that sufficient commerce will be developed on the upper river to justify the great expense that would be incurred in giving navigation around these two obstructions.

An ordinary portage railroad could be very easily built around them if it should be desirable. Probably a route for a portage along the west bank would be the most economical one to select, if other questions did not come in, to cause the one along the east bank to be chosen. By laying the portage on the east bank, a portion of the Colville Valley Road to Grand Rapids would be utilized.

Above Kettle Falls the river is navigable for twenty-six miles to the Little Dalles. These latter can be ascended by steamers using a line, but this is not, of course, satisfactory navigation. It would not take a very large amount of money to render this obstruction passable. In all probability, however, it will be found when the country becomes settled, and the river above the Little Dalles navigated, that a branch line of railroad will be required from the main Colville Valley up Mill Creek and Echo Valley, and through to the river above the Little Dalles. This branch line, in connection with the portion of the Colville Valley Road running through the lower part of the valley to the river below Grand Rapids, will form a portage road around all these falls. The length of

this line by the circuitous route that it would go is about thirty-five miles.

Above the Little Dalles the river is navigable for two hundred and eighty miles to Death Rapids, according to the estimate of Captain Pingstone, or two hundred and twenty-five miles, according to the estimate of Alexander Ross and others.

This extreme upper navigable portion of the river can be used most economically in connection with railroads, a portion of the railroad system giving a portage around the obstructions, and a river, as well as a rail communication, with the country below.

PORTAGE SYSTEM OF NAVIGATION.

As it must be many years before the improvements mentioned in the preceding discussion are completed or even undertaken by the general government, I will give a summary of the portages required to give a continuous line of river navigation from Snake River to Death Rapids, the river remaining in its present condition.

	River.	Portage.
	Miles.	*Miles.*
Snake River to Priest Rapids	73	
Portage around Priest Rapids		11
Priest Rapids to Cabinet Rapids	42	
Portage around Cabinet and Rock Island Rapids		7
Rock Island Rapids to Foster Creek Rapids	90	
Portage around Foster Creek and the rapids of the Nespilem Cañon to Mahkin Rapids		27
Mahkin Rapids to Grand Rapids	122	
Portage from Grand Rapids to above Little Dalles		35
Little Dalles to Death Rapids	225	
	552	80

In the months of February and March, 1880, Capt. Alfred T. Pingstone, of the Oregon Railway and Navigation Company, examined the Columbia from Kettle Falls to the Snake River. His examination was made at a very low stage of water, which must account partially for the difference in the descriptions of rapids, &c., as given in his report and in this. Captain Pingstone is a practical steamboat man and his opinions are entitled to great weight.

CAPTAIN PINGSTONE'S REPORT (EXTRACT).

IMPROVEMENTS NECESSARY TO INSURE GOOD STEAMBOATING.

Proceeding up the Columbia from Ainsworth until Priest Rapids are reached, the river is in an excellent boating condition during the open season of the year; and by making an easy portage of seven miles

around these rapids, an equally navigable river is had for fifty miles to Rock Island Rapids.

At Rock Island Rapids, by making a portage of eight miles, a clear river to the mouth of the Okinagan, a distance of seventy-seven miles, would be obtained. These two portages would give excellent navigation at all stages of water.

By making another portage of seven miles from the Okinagan to the head of cañon (no name) the river would be equally navigable to Hell Gate, twenty miles below the mouth of the Spokane.

At Hell Gate, navigation would be doubtful at a high stage of water; but for the proper kind of a steamboat it would be good for two-thirds of the season. Should it be deemed advisable to construct a portage road there, one about a mile long could easily be laid over a flat bench on the left bank of the river.

The boat that would go through Hell Gate at a medium stage of water, would go through to Grand Rapids, a distance of ninety miles above.

I have no hesitation in saying that, with the portages named, a stretch of river 438 miles long (from Wallula to Grand Rapids) would be thrown open to regular steamboat traffic that would be far better than Snake River at even a moderately low stage of water.

In brief, the improvements necessary are:

	Miles.
A portage at Priest Rapids of	7
A portage at Rock Island Rapids of	8
A portage from the Okinagan to Hell Gate of	7
	22
And possibly at Hell Gate a portage of	1

For descriptions at these various rapids see diary.

FROM AINSWORTH TO KETTLE FALLS.

By the use of lines at a medium stage of water, a boat could be taken from Ainsworth to Kettle Falls. Some risk would attend upon such an enterprise; all would not be clear work; but with care and moderate good luck the feat could be performed without serious loss or damage.

FROM GRAND TO DEATH RAPIDS.

As will be seen by the table of distances inserted below, the construction of the portages already suggested would give a navigable river for 427 miles above Walluia. I will state further that by the construction of a portage six or seven miles in length around Grand Rapids and Kettle Falls, a clear river up stream for twenty-four miles could be obtained and a portage—which would not be necessary at a medium stage of water—of a little over a mile at the Dalles would insure good navigation to Death Rapids, a distance of 280 miles further north. I know this from having navigated it with the steamer "49."

Distances.

[Down stream.]

	Miles.
From Fort Colville to mouth of Spokane	70
From Spokane to Hell Gate	20
From Hell Gate to head of cañon	80
From head to mouth of cañon	12
From cañon to mouth of Okinagan	12
From Okinagan to Chelan	32
From Chelan to head of Rock Island Rapids	45
From Rock Island through bad water	8
From thence to head of Priest Rapids	50
From head to foot of Priest Rapids	9
From foot of Priest Rapids to Ainsworth	89
	427

DIARY.

February 28, 1881.—Having secured the services of two Pend d'Oreille Indians, one of whom, twenty years ago, had made the trip down the river when in the employ of the Hudson Bay Company, we left Kettle Falls in a birch-bark canoe, which was about twenty-five feet long and weighed eighty pounds. Kettle Falls are distant from Fort Colville about fifteen miles. They are the most serious obstruction to navigation on this part of the Columbia, being a perpendicular fall of about twenty feet at low water. We embarked in the morning at about eleven o'clock, and proceeded thence down the river for about five miles, when we arrived at Grand Rapids. The river is now at dead low water. These rapids are about one and a half miles in length and have three riffles. The upper and lower ones could be run by boats either up or down stream without the use of lines, but the middle rapid has a fall of about seven feet. It could be run at high water with a line. This would be a proper landing for Fort Colville. We made a portage around the rapid of about one hundred yards, and camped just below Grand Rapids for the night.

March 1.—Left foot of Grand Rapids at 8:20. Three miles below Rickey's Bar there is a high bench of rocks on the right bank of the river coming down. These rocks are in the bend of the river and would form an island at high-water with the channel on either side. It would be no obstruction to navigation. On Rickey's Bar there is some drift, and a few trees standing. Four miles below that, opposite what is called the "Five thousand dollar claim," there is a heavy rapid—very strong water—with bed-rock sticking up on both sides of the river; best channel at the head of rapid is in middle of river, thence down left bank and at the foot to the right bank. The river is then good to Rogers' Bar, about thirty miles below. Shoal riffle at Rogers' Bar. Just below Rogers' Bar there is a large island of rocks, also a riffle running part way across, but a good steamboat channel there. Below, about six miles, there is another bench of rocks with channel on the right bank of the river. Three miles

below that is another bench of rocks in the middle of the river; straight channel about a hundred feet wide on right bank. There is a good country along the Columbia from Colville to this point, large flats and valleys running into the river. Back of Rogers' Bar there is a settlement of eight or ten families with promised additions from outside this spring. From this point to Spokane River there is but little good land along the Columbia. There are many bars with quite a number of Chinamen mining upon them. The river has many swift rapids in it, but none that a powerful boat could not make. We camped eight miles above the mouth of the Spokane River.

March 2.—Left camp at seven a. m. River very crooked; very swift; many heavy rapids; mountains high and close in on the river, and heavily timbered. Saw a good many Chinamen mining on the bars. Arrived at Spokane River at nine a. m., and went up and took a look at the new United States post. The Spokane is not navigable, but discharges considerable water. There is as much water in it as in the John Day. The "post" is located on the south side of the Spokane about 2 miles from its mouth. There are three companies stationed there. The location is good; it is on high table land, surrounded by scattering pine timber. Was informed there that the country in the immediate vicinity was settling up fast, and that it would support a large population. Arrived back at the canoe at about three p. m.

Immediately above the mouth of the Spokane is a strong rapid. The river (Columbia) at this point runs between two bars covered with very large bowlders. The channel is straight; current very swift. It would be all a boat could do to stem it at high-water, but by the use of lines for one hundred yards she could make it. The river from this point down to Virginia Bills, a distance of five miles, is very rapid. There are high rolling hills on the left, and mountains on the right. We camped five miles below the mouth of the Spokane.

March 3.—Left Camp at seven a. m. Paddled the first fourteen miles through a cañon. The river is good—not more than a four-mile current. Mountains very high and rocky. In many places the walls of rocks are from 500 to 1,000 feet in height, rising perpendicularly from the river. There is some mining carried on upon what few bars there are in the cañon. At nine a. m. we arrived at Hell Gate. Here the channel makes a complete S. A boat could go through it now, but it looks as though it would be a rough place during high water. There are two big islands of rocks in the river a hundred feet high at this stage of water; a boat could get either up or down. A quarter of a mile below Hell Gate a reef of rocks runs nearly across the river. The channel is on the right bank. From thence on down to a mile below mouth of Sam Poo-el [Sans-Poil] Creek, which comes in from the right bank; the water is strong. Up to camping ground (four miles below Sam Poo-el) the river was good. The timber extends twenty miles below the mouth of the Spokane River. The hills along the Columbia in the vicinity of this creek are much lower than above;

but there is not much good farming land in sight. The country looks barren. No timber in view.

March 4.—Left camp at seven a. m. The mountains close in on the river. Current very swift—from five to seven miles per hour. Ten miles below the Nespilem there is a bad rapid in the bend of the river. Boats could not ascend without the use of a line at this stage of water for at least two hundred feet. From thence on down to the head of the cañon the river is very rapid—high bluffs on one side, high bowlder-bar on the other. For two miles down from head of cañon it is good steamboating. High hills of rocks extend on both sides of the river for over a mile. You could get a boat through this cañon, but it would not do to make a business of running it; there would have to be a portage here. There is a good location for a portage road on the right bank of the river; it could be run across a bend, and * * * it is twelve miles up river from the Okinagan to the foot of the cañon. The road would have to leave the river a mile above Fort Okinagan and cut across the country, striking the river at the head of the cañon—a distance of about seven miles—easy grade over bunch-grass hills—no timber. Fort Okinagan was formerly an important post of the Hudson Bay Company, but is now abandoned. The Okinagan enters the Columbia from the right bank, but, although a large stream, is not navigable for steamboats except at high water, and then only to Osooyoos Lake, seventy-five miles distant from Columbia River, located in British Columbia.

March 5.—Left camp at mouth of Okinagan at seven a. m. Arrived at mouth of Chelan River at eleven a. m., distant thirty-two miles, with only three rapids in that distance. One is about five miles below the Okinagan in the bend of the river. Another rapid is located below the mouth of the Methow River; good enough steamboating; big rocks on both sides; some in the river; water very swift. There is another rapid about ten miles above the Wenatchee—shoal water, bars and rocks. A few miles below Chelan there is plenty of timber for wood. There are a good many pine flats along this part of the river that will be good for settlement. Camped ten miles above mouth of Wenatchee. The river I have passed over to-day is in every way suitable for steamboating.

March 6.—Left camp at 7:10 a. m. The river was good to the head of Rock Island, a distance of twenty miles. The bad water commences about three miles above what is called Rock Island. The Wenatchee River empties in from the right bank, and is a large body of water, but not navigable. Rock Island Rapids, so called, are located in a cañon two miles in length. This cañon contains many rocky islands. There is one which rises from the river to the height of a hundred feet. This cañon would be a rough place for a boat to get through during high-water, but during an ordinary stage is navigable. For two miles (between the cañon and Rock Island proper) there is a good river. Rock Island Rapids proper are not navigable at this stage of water. Boats may be taken up or down at a high stage of water—but always at great risk to the

boats. There are two channels –the one on the right bank is widest. The upper end is clear of rocks, but the lower end is crooked and full of high bed-rock. It is cut up in many small channels and so rapid that a steamboat could not stem it without the assistance of a line. The channel on the left bank ends in two little falls at this stage of water, but it would be best to take a boat through at a little above a half stage. Rock Island can never be successfully steamboated in its present condition, but at comparatively small expense can be made navigable at low water. The water is bad for four miles below the island. One place, particularly, is very narrow, crooked, and rocky, and has a fall of five feet in three hundred.

The best farming country we have passed through to-day is the Wenatchee country. I was told by an old settler that there is room there for quite a number of people. They are raising all kinds of grain and fruit (even peaches) there. A good many high bars that we passed today would make good farming land. On the mainland timber is scarce; it is a bunch-grass country. We camped about three miles below the island. A portage will probably be necessary at this point, commencing about three miles below Rock Island Rapids, on the right bank, and ending in about four miles. This portage road would pass over a high flat with an easy grade—no excavation necessary if railroad were built there.

March 7.—Left camp at 9:15. We broke our canoe yesterday, and were some time in fixing it. The river is very good to-day. Found only one rapid. It is called "Eagle Rapid" and is located about thirty miles below Rock Island. It can be navigated by steamboats at all stages of water. The river from Eagle to head of Priest Rapids is excellent for boating purposes. We camped at Priest Rapids at six p. m. During the day's run found high banks on either side the entire course. We passed the mouths of two coulées.

March 8.—Priest Rapids are about nine miles in length. They are situated in a semicircular bend of the river. There are five rapids in all from the upper to the lower, inclusive. The water is very swift, but the two riffles at the head are the worst. There is a stretch of five miles of good water between the middle and lower riffles. The latter are full of reefs and bowlders.

By the use of a line at a middle stage of water, a steamboat could be taken over. A portage road across the bend over a flat bar on the left bank of the river would be about seven miles—not to exceed that. There is plenty of drift-wood at the head of rapids. We ran the rapids with our bark canoe, and camped at Ringgold Bar, about forty miles from the mouth of Snake River. Excellent steamboating from Priest Rapids at all stages of water. Country on both sides of river, high plateaus. On left bank, high "white bluffs" rising 180 to 200 feet; on the right, a large flat plateau of bunch-grass country. Think it is good land.

March 9.—Left camp at seven a. m. The river from here to mouth of

Snake River is excellent at all stages of water for steamboating. We arrived at Ainsworth at twelve m., our journey ended. I proceeded to Portland, taking the canoe which so safely has carried us to our destination, while my two Indian companions leave for Fort Colville overland, a distance of 210 miles.

Very respectfully,

ALFRED T. PINGSTONE.

CHAPTER VII.

GENERAL DESCRIPTION OF THE COLUMBIA AND ITS TRIBUTARIES.

In the early development of a country its navigable rivers play a very important part, furnishing natural highways for travel and trade, and bases of operations from which the adventurous pioneer can extend his researches after the unknown attractions of the wilderness. As the population and productions of the country increase, and railroads are built in every direction, these artificial lines of communication make the natural river lines of less relative importance. In the full and complete development, however, these water lines furnish transportation for all the slow freight and surplus productions, and act as a regulator upon all of the internal commerce of the country. Their great value in this respect cannot be overestimated, and the general government has for many years shown its wisdom by opening up and freeing from obstructions the natural water-courses within its domain as fast as they are required by the demands of commerce.

The great country drained by the Columbia River is still in its infancy, and it is the cherished scheme of all who are alive to its best interests to see the whole river, or as much of it as is practicable, open to free navigation, and the healthful competition which would grow therefrom.

In these pages I have added as much as I am able to the knowledge of the river and the country dr ined by it, and trust that it will be useful in any effort that may be made to secure the free navigation of the whole of it, or at least of a very large portion.

Entering the Pacific Ocean near the forty-sixth degree of latitude, this river forms a great arm of the ocean, up which sea-going vessels can go for one hundred miles and more to the foot-hills of the great range of mountains whose snow-clad summit peaks can be seen by the sailor as he nears the foaming breakers at the river's mouth.

The Columbia by means of its tributaries drains the western slope of the Rocky Mountains, from about the forty-second to the fifty-third parallel of north latitude, a distance of about 900 miles, and has a drainage basin aggregating almost 245,000 square miles.

The following table gives the areas drained in the different States and Territories by the most important tributaries:

DRAINAGE AREAS.

	Square miles.
Oregon:	
Willamette (and Columbia below mouth of Willamette)	12,600
Des Chutes	10,000
John Day, Willow Creek, and Walla Walla	12,600
Snake River	17,200
Washington Territory:	
North side Columbia, below Snake	8,000
Columbia, above Snake	30,360
Snake	5,200
Idaho:	
Columbia River	7,600
Snake River	70,040
Nevada, Snake River	6,280
Wyoming, Snake River	5,184
Utah, Snake River	700
Montana, Columbia River	20,800
British Columbia, Columbia River	38,395
Total area drained by Columbia—square miles	244,959

This is an area larger than all the New England and Middle States, with Maryland, Virginia, and West Virginia combined. For purposes of comparison, I give their areas as taken from the last Census Report:

	Square miles.	
Maine	35,000	
New Hampshire	9,280	
Vermont	10,212	
Massachusetts	7,800	
Connecticut	4,750	
Rhode Island	1,306	
		68,348
New York	47,000	
Pennsylvania	46,000	
New Jersey	8,320	
Delaware	2,120	
		103,440
Maryland	11,124	
Virginia	38,348	
West Virginia	23,000	
		72,472
Total square miles		244,260

I also give here for comparison the areas of the principal European countries:

	Square miles.
Great Britain and Ireland	121,230
France	201,900
Germany	212,091
Austria Hungary	226,406
Italy	112,677
Spain	182,758

The drainage area of the Columbia may also for convenience be divided as follows:

	Square miles.
Snake River	104,604
Upper Columbia above junction with Snake	97,155
Main Columbia below junction	43,200
Total	244,959

At a distance of 336 miles from the sea the main river is formed by its two great branches, the southern one being now generally known as the Snake and the northern as the Columbia.

THE SNAKE RIVER.

The Snake River takes its rise in the southern part of the Yellowstone National Park, very near the headwaters of the Madison Fork of the Missouri and the Green River branch of the Colorado, the former flowing to the Gulf of Mexico and the latter to the Gulf of California. From its source the Snake takes a southwesterly course until it comes within sixty miles of the present limits of the Great Salt Lake of Utah. It has been clearly proven that this lake, in the years long gone by, was very much larger than it now is, covering an immense extent of territory, and that its waters found an outlet to the north into the Snake River and thence to the Columbia and Pacific Ocean. The outlet of this ancient lake was determined and its boundaries traced by a party of the Wheeler Survey, who gave to it the name of Lake Bonneville, after the first and most illustrious explorer of this section of the country. The gradual upheaval of the northern portion of the continent has taken away the outlet and left the lake what it now is.

From the vicinity of the Great Salt Lake the river takes a northwesterly course, flowing through a tremendous cañon in which are numerous rapids and falls of great magnitude and beauty, ranking with Niagara and the falls of the Zambesi in Africa. The principal are the Great Shoshone Falls, the American Falls, and Salmon Falls. A number of streams flow into the Snake from the lands to the south and west of its course, principal among them being the Bruneau, Owyhee, Malheur, Burnt, Powder, and Grand Ronde Rivers. The main branches from the east are the Malade, Boisé, Payette, Salmon, Clearwater, and Palouse Rivers.

Nearly all the streams flowing into the Snake may be characterized as mountain torrents flowing through deep cañons, entirely unnavigable and with very little valley lands along their courses.

Some of them deserve more than a passing mention, especially the Salmon, the principal tributary of the Snake. It drains a large extent of country and joins the Snake about fifty miles above Lewiston, and flows through probably the deepest, grandest, and most impassable cañon of any stream of corresponding magnitude in the world.

Nowhere on earth can there be a scene more grand, gloomy, and deso-

late than where these two rivers join their waters. Both come flowing down with torrential velocity through cañons 3,000 feet in depth, with ragged, black, and almost vertical sides, the milk-white waters of the Snake coursing alongside the clear blue Salmon water for a half mile or more before they finally mingle among the jagged rocks of the stupendous cañon below.

At Lewiston the Clearwater adds its waters, and it is from this point to its mouth that the Snake is at present navigable and navigated by steamers. Steamers can pass, however, nearly up to the mouth of the Grand Ronde, thirty miles above Lewiston; but as there is nothing to call them up they do not now traverse this portion of the river.

A steamer has been run up the Snake for about eighty miles above Lewiston, occupying fourteen days in making the ascent, of which thirteen were taken up in making the last thirty-five miles. The run down was made in one day; I was once informed in five hours. This illustrates the character of the Snake River for purposes of navigation.

The Palouse is the lowest tributary of the Snake, and, although not of any importance as a large stream, it drains an exceedingly fertile and promising country. A large proportion of the best farming lands of Eastern Washington Territory lie along the Palouse and its tributary streams.

THE UPPER COLUMBIA.

The great northern branch which unites with the Snake to form the main river is designated as the *Columbia*, or in contradistinction to the *lower* river, as the *Upper Columbia*.

Amid the universal gloom and midnight silence of the north, a little above the fifty-second parallel of latitude, seemingly surrounded on all sides by cloud-piercing snow-clad mountains, and nestled down in among the lower and nearer cedar-mantled hills, there lies a narrow valley where three streams meet and blend their waters, one coming from the southeast, one from the northwest, and one from the east. The principal one of these three streams is the one from the southeast, which rises in a small lake near the fiftieth parallel of latitude, and flows to the northwest in a deep gap between the main Rocky Mountain chain on the east and the Selkirk Range on the west, to the point of junction, and is the headwater stream of, and bears the name of the Columbia. It is about one hundred and eighty miles long, and is said to be navigable for more than half the way.

The northwestern stream is the extreme northern branch of the Columbia, rising beyond the fifty-third parallel of latitude, and is known among the fur traders and *voyageurs* as *Canoe* River, from the excellence of the bark procured on its banks for canoe building. This is a small river, forty yards wide at its mouth, flowing through a densely timbered valley in which the trees overhang the stream to such an extent as almost to shut it out from the light of heaven, and attain an enormous

size, particularly the pines and cedars, one of the latter, measured by Alexander Ross, being forty-five feet four inches in girth at a height of four feet from the ground.

Portage River, the third of this trio of streams, the smallest and the most remarkable of them, is the one which enters from the east. It has its source in the very heart of the Rocky Mountains and flows through a tremendous cleft in the main range between two of its loftiest peaks, Mounts Brown and Hooker. Just underneath these giant mountains, on the divide known as "The Height of Land," lie two small lakes, each about thirty yards in diameter, and which are only a few yards from each other. One has its outlet to the west, Portage River, flowing to the Columbia; the other has its outlet to the east, Whirlpool River, a branch of the Athabasca, which joins the Mackenzie and flows to the Arctic Ocean.

The elevated valley in which these lakes are situated is called the Committee's Punch Bowl, and the nabobs of the fur trade always treated their companions to a bucket of punch when this place was reached, if they had the ingredients of which to make it, and they usually had.

The pass across the mountains by the Portage River, the Committee's Punch Bowl, and Whirlpool River, known as the Athabasca Pass, was for many years the principal route of the British fur traders in going from one side of the Rocky Mountains to the other. This route is far from being an easy one, and a description of the difficulties, dangers, and discomforts attendent upon a trip over it will certainly deter any one from making the journey for pleasure. A great part of the way the traveler has to wade up to his middle in the icy waters of the Portage River. The journey had to be made in the spring before the summer thaws and rains set in, or in the autumn after severe cold weather had locked up the mountain drainage. During the summer the stream becomes an impetuous impassable mountain torrent. Alexander Ross, after making the journey from the Columbia to the Athabasca, thus pictures the delights of the journey up Portage River:

> Let the reader picture in his own mind a dark, narrow defile, skirted on one side by a chain of inaccessible mountains rising to a great height, covered with snow, and slippery with ice from their tops down to the water's edge; and on the other side a beach comparatively low, but studded in an irregular manner with standing and fallen trees, rocks, and ice, and full of drift-wood, over which the torrent everywhere rushes with such irresistible impetuosity that very few would dare to adventure themselves in the stream. Let him again imagine a rapid river descending from some great height, filling up the whole channel between the rocky precipices on the south, and the no less dangerous barrier on the north; and lastly, let him suppose that we were obliged to make our way on foot against such a torrent, by crossing and recrossing it in all its turns and windings, from morning till night, up to the middle in water, and he will understand the difficulties to be overcome in crossing the Rocky Mountains.

The junction of the three streams above alluded to is known as *Boat Encampment.* From this point the Columbia flows nearly due south for about four hundred miles, to where it makes its great bend to the west at the mouth of the Spokane River.

For the first one hundred and fifty miles of its course it flows, as a general thing, through a deep cañon, closely shut in on each side by towering mountains so near to each other as to confine the view to the rocky heights on each side and the sky above. Numbers of small streams come into the main river from the east and west, and generally their waters come in over some towering cliff in the form of a cataract, some of which are very curious and beautiful. One, coming into the river just above the *Dalles des Morts*, is described by a visitor* as follows:

> A little after starting we backed our paddles and stood still for some minutes admiring a striking natural curiosity on the east side. The water of a cataract creek, after shooting over the brink of a bold precipice, falls in a white sheet on to a broad flat rock, smooth as glass, which forms the first step; then upon a second, some ten feet lower down, and lastly, on a third, somewhat lower. It then enters a subterraneous vault, formed at the mouth like a funnel, and after passing through this funnel it again issues forth with a noise of distant thunder. After falling over another step it meets the front of a bold rock, which repulses back the water with such violence as to keep it whirling round in a large basin. Opposite to this rises the wing of a shelving cliff, which overhangs the basin and forces back the rising spray, refracting in the sunshine all the colors of the rainbow. The creek then enters the Columbia.

Numerous islands exist in the river, some of them remarkable for being formed almost, if not entirely, from drift-wood, compressed by the force of the current so closely and solidly together that it seems to have been laid in tiers as by the hand of man. The *Selkirk Range*, whose jagged, craggy peaks are from 7,000 to 9,000 feet high, lies to the east of the river. To the west lies the low *Gold Range* from 2,000 to 5,000 feet high, and beyond this and between it and the Okinakane and the Thompson Rivers the country is generally rolling and covered with bunch grass.

At a distance of about seventy miles from Boat Encampment there is a very bad system of rapids, known to the *voyageurs* as the *Dalles des Morts*. They are about two miles long from end to end. Many a poor fellow has closed his earthly career by intrusting himself in their treacherous waters, and a number of solitary graves are here to be seen, and names of victims never found are carved on the surrounding rocks.

At a distance of about twenty-three miles from the Dalles des Morts, down the river, there is a remarkable height on the east side of the river, partly covered with snow and partly with numerous towering rocks, broken fragments, peaks, and serrated ranges, resembling the turrets, domes, spires, and steeples of a city in ruins. The mist hanging over the place adds to the deception, and the longer this City of Rocks is looked at the more complete becomes the illusion.

Twenty-two miles below the City of Rocks are the Little Dalles, or Narrows, where for about a mile the river is almost completely shut in by mountains and rocks. This is passable by steamers, however, while at the Dalles des Morts steamers are unable to ascend.

Along this portion of the river there occurred in the year 1817 one of

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* Ross.

those terrible episodes of frontier life, at the thought of which the heart turns sick. On the 16th of April of this year, a party of twenty-three men left Fort George, now Astoria, to ascend the Columbia and cross the Rocky Mountains by the Athabasca Pass. On the 27th of May they arrived at the mouth of the Portage River, or Boat Encampment, after the most severe labors and exposure in dragging their canoes up the rapids and making their way along the rocky shores. Seven men of the party were so weak, sick, and worn out, that they were unable to proceed across the mountains, so they were given the best canoe and some provisions and sent back down the river to Spokane House. After leaving the Rocky Mountains they went rapidly down the river until the Dalles des Morts were reached. Here, in passing their boat down over the rapids by a line, it was caught in a whirlpool and the line snapped, and the boat and all its contents of provisions, blankets, &c., was irrevocably lost. Here the poor fellows found themselves utterly destitute, and at a season of the year when it was impossible to procure any wild fruit or roots. The continual rising of the water completely inundated the beach, which compelled them to force their way through a dense forest, rendered almost impervious by a thick growth of prickly underbrush. Their only nourishment was water. On the third day Maçon died, and his surviving comrades, though unconscious how soon they might be called on to follow him, divided his remains into equal parts, on which they subsisted for several days. From the sore and swollen state of their feet, their daily progress did not exceed two or three miles. Holmes, the tailor, shortly followed Maçon, and they continued for some time longer to sustain life on his emaciated body. In a little while of the seven men only two remained alive, Dubois and La Pierre. La Pierre was subsequently found on the borders of the Upper Lake of the Columbia by two Indians who were coasting it in a canoe. They took him on board and to Kettle Falls, from whence he was conducted to Spokane House. He stated that after the death of the fifth man of the party, Dubois and he continued for some days at the spot where he had ended his sufferings, and on quitting it they loaded themselves with as much of his flesh as they could carry; that with this they succeeded in reaching the Upper Lake, around the shores of which they wandered for some time in search of Indians; that their horrid food at length became exhausted, and they were again reduced to the prospect of starvation; that on the second night after their last meal, he (La Pierre) observed something suspicious in the conduct of Dubois, which induced him to be on his guard; and that shortly after they had lain down for the night, and while he feigned sleep, he observed Dubois cautiously opening his clasp knife, with which he sprung on him, and inflicted on his hand the blow which was evidently intended for his neck. A silent and desperate conflict followed, in which, after severe struggling, La Pierre succeeded in wresting the knife from his antago-

nist, and having no other resource left, he was obliged in self-defense to cut Dubois's throat, and that a few days afterward he was discovered by the Indians as above mentioned.*

At a distance of thirty-seven miles below the Little Narrows the head of the Upper Arrow Lake is reached. This is an enlargement of the river, in which, however, very little current is to be detected. It is about thirty-three miles long and three wide. The view along this portion of the river is much more open and the country more level than along the river to the north.

For about sixteen miles the river narrows somewhat until the Lower Arrow Lake is reached. This lake is two and a half miles wide and about forty-two miles long, and is a beautiful sheet of water.

About ten or twelve miles below the southern extremity of the Lower Arrow Lake there comes in from the east the Kootenay River, the largest branch of the Upper Columbia. This river pursues a very circuitous course and drains a large extent of mountainous country. It rises near the fifty-first parallel of latitude and pursues a southerly course for three hundred and fifty miles to the old Kootenay Fort. Here it makes a great bend to the northwest, and after flowing in this direction two hundred miles it makes another turn to the southwest, and in fifty or sixty miles distance reaches the Columbia. Just before making this last turn it flows through a lake about seventy-five miles long and from two to five broad, similar to the Arrow Lakes of the Columbia. This Kootenay Lake and a great part of the river is navigable, but in the lower portion of its course it breaks through the Selkirk range of mountains and has many rapids and falls, one fall of fifteen feet being a short distance from the Columbia. Its principal tributaries are the Mooyic, the Yakh, and the Tobacco rivers, all small streams. This is the first of the tributaries of the Columbia which flows in any portion of its course within the territory of the United States, a great portion of its angular southern bend lying south of the forty-ninth parallel.

The headwaters of the Kootenay are within a very small distance of the headwaters of the Bow River, a tributary of the Saskatchewan, which flows to Hudson's Bay.

Just north of the forty-ninth parallel, and about twenty-four miles down from the mouth of the Kootenay, there enters the Pend d'Oreille River or Clarke's Fork from the east. This is the longer and by far the most important branch of the Upper Columbia, although it is doubtful if it flows as much water as the Kootenay. It drains all that portion of the country lying between the Rocky and the Bitter Root Mountains.

The Flathead River is its principal northern tributary; rising in British Columbia it flows south, through Flathead Lake, a magnificent sheet of water, and unites with the Missoula River to form the main Pend d'Oreille.

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* Ross Cox.

Joshua Pilcher, one of the early explorers of this country, says of this Flathead Lake:

It is about thirty-five miles in length by five or six in width. This lake communicates with Clarke's River and is formed by its northern branch. It is surrounded by lofty mountains, whose summits are in many cases covered with perpetual snow. It lies in a valley, which is extensive, rich, and would support a considerable population. The valley itself is covered with luxuriant grass, and the foot of the mountains with a variety of timber and vegetation indicating the richest soil. * * *

The upper parts of Clarke's River issue from rugged mountains covered with almost impenetrable forests of pine and cedar, but there are several situations on this river which would admit of settlements to a considerable extent; and though not comparable in fertility of soil to the rich lands of Missouri and Illinois, yet superior to many of the inhabited and cultivated parts of the Atlantic States, where powerful communities have grown up. The Flathead Lake and its rich and beautiful valley are on this fork, and vie in appearance with the beautiful lakes and valleys of Switzerland. At the foot of the mountains, according to information, there is a belt or strip of fertile land, similar to what is seen at the foot of the Alleghany and Blue Ridge.

The Saint Regis Borgia, Bitter Root, Hell Gate, Big Blackfoot, and Deer Lodge rivers are the main feeders of the Missoula.

It is a singular fact that all the large rivers of the north, in some portion of their course, open out into a lake or lakes; it is so with the Pend d'Oreille River, the lake of the same name being an enlargement of the river with a great arm to the south.

This lake is crossed by the forty-eighth parallel of latitude and is situated wholly within the territory of Idaho. This river is of great importance, furnishing, as it does, a practicable and easy pass across the Bitter Root Mountains for a railroad, which is being utilized by the Northern Pacific Railroad Company. The Pend d'Oreille Lake and the river in its vicinity are navigable; no other portions of the river are, as far as I have been able to learn.

At its mouth the river is about fifty yards wide, and pours itself into the Columbia in one fine foaming sheet over a ledge of rocks eight or ten feet high, which bars it across from side to side.

Pursuing its course to the southward through a most beautiful country, the next tributary of importance coming into the Columbia is the Spokane River, which drains a large portion of the country west of the Bitter Root Mountains, is the outlet of Cœur d' Alêne Lake, and, flowing westward, reaches the Columbia where it makes its big bend to the west. No other stream comes into the left bank of the Columbia until it is joined by the Snake.

Several small streams draining the country of the Colville Indians flow from the north, but none of any magnitude until the Okinakane is reached. This noble river is the outlet of a mountain-environed lake, about eighty miles in length, lying between 49° 30′ and 50° 30′ north latitude. There are a number of beautiful lakes in the course of the river below the large fountain lake.

From the region of the Cascade Mountains, and draining their eastern slopes, several streams come in to swell the Columbia—the Methow,

Chelan, Entatqua, Wenatchee, and Yakima, being the only ones worthy of notice.

Shortly after joining the Snake the Columbia makes a great bend to the west and receives in succession the Walla Walla, Umatilla, John Day, Des Chutes, Klikitat, Willamette, Cowlitz and other rivers and streams, and, after breaking through the Cascade Mountains, in a gorge unsurpassed on earth for beau y and grandeur, in latitude 46° 15′ it pours its fresh majestic flood through the white-capped breakers of its bar into the placid western ocean.

CHAPTER VIII.

HISTORY OF THE DISCOVERY AND EXPLORATION OF THE COLUMBIA RIVER.

About the same time in the eventful year of 1492 that the indomitable energy and genius of Columbus was rewarded by his discovery of a new world, a conclave of cardinals at Rome rewarded an almost unparalleled course of hypocrisy by electing Alexander VI Pope of Rome.

The temporal power of the Roman Church began about this time to topple and to take its downw ard course to the pitiful condition which it occupies at present. Alexander VI, "the incarnation of the secular spirit of the papacy," made grand efforts to re-establish and perpetuate the temporal power of the church, yet, notwithstanding all his efforts, this successor of Peter appears for the last time in history as the undisputed bestower of kingdoms and the ultimate tribunal of appeal for Christian nations. Spain and Portugal resorted to him for the adjustment of their claims to the new world; by tracing a line on a map he disposed of three-fourths of the human race, and more than three-fourths of the world of land and water.

Never, according to mediæval ideas, had a Pope exerted his prerogative with equal grandeur to that when Alexander VI bestowed upon the two greatest maritime powers of Europe, to each one-half of the Pagan world of land and water and human beings; that world then just beginning to be dimly seen by the light of the magnificent discoveries of Columbus and his successors.

Upon these extraordinary grants was founded the celebrated *treaty of partition of the ocean*, concluded in 1794, by which the Portuguese were to enjoy and possess the exclusive rights of discovery, trade, conquest, and dominion in all the seas and territories not previously belonging to a Christian prince or people, *east* of a meridian line passing three hundred and seventy leagues west of the Cape Verde Islands, and the Spaniards were to possess all seas and all Pagan lands *west* of that line.

The two nations having thus, under the sanction and guarantee of the highest power in Europe, settled the conditions by which they appropri-

ated to themselves the entire Pagan world, without regard to the claims or desires of anybody else, each continued its search for a navigable passage to India.

The Portuguese were soonest successful, by sailing around the southern extremity of Africa, and establishing their colonies and influence in many of the regions of Southern Asia. They also obtained possession of Brazil, which was found to lie to the *east* of the dividing meridian, very much to the exasperation of the Spaniards, who had expected by the treaty of partition to have exclusive dominion over the countries lying to the west of the Atlantic.

The Spaniards labored with great earnestness and success in planting colonies in the West Indies, and in exploring the coasts in the vicinity, which they soon ascertained to be the borders of a great continent.

With the object of ascertaining the extent of this continent, they persevered in their examinations, in which they were encouraged by the constant assurance of the natives of the coasts and islands respecting the existence of a great sea and rich and powerful nations towards the setting sun.

In the year 1513 this great sea was discovered near where Panama now stands by Vasco Nunez de Balboa. This was naturally supposed to be the Southern Ocean which bathed the shores of India, and as its proximity to the Atlantic was at the same time ascertained, it was very reasonably hoped that the two oceans would be found to be connected in such a manner as to afford a speedy and safe passage for ships from one to the other. This hope found encouragement in the fact that a Portuguese navigator named Cortereal claimed that in 1499 and 1500 he sailed through a narrow channel, named by him the Straits of Anian, into another great sea communicating with the Southern or Indian Ocean.

The great hope was, however, dispelled, as the explorations soon proved conclusively the entire separation of the oceans in the regions near the West Indies.

In the year 1520 Fernando Magellan discovered and sailed through the strait bearing his name, south of the American continent, into the great ocean discovered by Balboa, and proceeding westward, India was reached, and for the first time in the history of mankind the world was circumnavigated.

This route for reaching India by the Straits of Magellan was not satisfactory, owing to its length, difficulties, and dangers, and the search was still continued for other and more direct channels from the Atlantic to the Southern Ocean.

The wealthy and powerful Empire of Mexico was discovered in 1518, and a few years after it was conquered for the Spanish Crown by Hernando Cortes, after one of the most heroic and cruel campaigns recorded in human annals.

When the conquest of Mexico had been completed the Spaniards im-

mediately turned their attention to the northwestern coast of America. Their expeditions by sea and land in that direction were numerous, and Cortes himself set the example by undertaking several of the earliest at his own expense and conducting one of them in person. The Emperor had exhorted him to explore the northern seas in search of "the secret" of a strait which should abridge the voyage from Spain to the East Indies, and he willingly engaged in the new enterprises of extending the Spanish power into other and as yet unexplored regions, and of solving, perhaps, the long-studied problem of a direct northern passage by water to Cathay.

The belief in the existence of such a northwest passage to India, joining the Atlantic in the position variously assigned to Cortereal's Straits of Anian, was wide spread among the maritime nations of Europe, and, all joining in the search, many voyages of discovery were made along both coasts of North America during the sixteenth and seventeenth centuries. Many false reports of the discovery of the desired channel were circulated, the effects of which reports were to spur all to greater exertions, and to promote very materially the explorations in the western world.

Foremost among all on the western coasts were the Spaniards, urged on by the indomitable Cortes. He and his successors on the vice-regal throne of Mexico gradually extended the knowledge of the coasts. The vacillating and selfish policy of Spain, however, greatly hindered her own subjects from pursuing their explorations with vigor, and her claim to exclusive dominion over all the western world deterred mariners of other nations from making persistent efforts.

Until the beginning of the seventeenth century the Spanish navigators pushed their voyages of discovery as far as they could along the coasts of Western America, and then they ceased almost entirely for a hundred years and more, owing to the change in the policy of Spain. She had ceased to desire the existence of a northwest passage from Europe to the Pacific, because, though such a passage might in some respects be useful to her, it would be greatly more injurious to her in other respects, inasmuch as it would bring down upon her possessions in the Pacific and Indian Seas the piratical cruisers of the northern nations of Europe. The expeditions of Drake and Cavendish had shown that the circuit of Cape Horn did not furnish to Spain a complete security for her possessions in the Pacific. Still more alarming would have been their insecurity if accessible by an easy passage from the vicinity of Hudson's Bay.

In this connection, and illustrating the policy of Spain, it may be interesting to know that in the time of Philip II it was proposed to cut a canal through the isthmus of Panama for the passage of ships from one ocean to the other, and two Flemish engineers were sent to examine the place with that object. They, however, found the obstacles insuperable, and the Council of the Indies at the same time represented to the

King the injuries which such a canal would occasion to the monarchy, in consequence of which his majesty decreed that no one should in future *attempt, or even propose, such an undertaking under penalty of death.**

All this time the Columbia was pouring its undiscovered waters into the Pacific, and the Spanish and English navigators who ventured into this western ocean went blindly by it.

Discovery in the North Pacific was revived by Russia, who, in consequence of her Asiatic possessions, very naturally turned her attention to the opposite coast of America. The voyage of Behring and Tschirikow, in 1728, 1729, and 1741, led to a more exact knowledge of the relative bearings of the Asiatic and American coasts in the high northern latitudes, and to the Russian establishments on the Aleutian Islands and the promontory of Alaska.

These events alarmed Spain and stimulated England, and the numer ous voyages of these two nations to the northwest coast ensued.

Passing by those voyages which added nothing to the knowledge of the Columbia, or gave no clue to its existence, we come to the years 1774 and 1779, when three exploring voyages were made by order of the Spanish Government, in which the west coasts of America were examined as far north as the sixtieth degree of latitude. The second of these voyages was under the command of Capt. Bruno Hecata, and he, on the 15th of August, 1775, arrived opposite an opening, in the latitude 46° 17′, from which rushed a current so strong as to prevent his entering it. This circumstance convinced him that it was the mouth of some great river, or, perhaps, of the straits of Fuca, which might have been erroneously placed on his chart. He in consequence remained in its vicinity another day in the hope of ascertaining the true character of the place, but, being stili unable to enter the opening, he continued his voyage towards the south.

On the opening in the coast thus discovered Hecata bestowed the name of *Enseñada de Asuncion*, or *Assumption Inlet*, calling the point on its north side *Cape San Roque*, and that on the south *Cape Frondoso*, or *Leafy Cape.* In the charts published in Mexico soon after the conclusion of the voyage, the entrance is called *En Señada de Hecata*, or Hecata's Inlet, and *Rio de San Roque*, or river of *Saint Roc.* It was undoubtedly the mouth of the great river of the western side of America; the same which was, in 1792, first entered by the ship Columbia, from Boston, under the command of Robert Gray, and has ever since been called the Columbia. The evidence of its first discovery by Hecata on the 15th of August, 1775, is unquestioned.

By this time the power of Spain in the New World had become very much reduced, owing to the continual and daring warfare and explorations carried on by the gallant sailors of Britain and her American colonies.

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* Greenhow.

The Pacific was now open to the adventurous sailors and traders of all nations.

In the mean time the English and French, and their American descendants, had been pushing their discoveries to the west from the Atlantic coasts, and each year saw something added to the knowledge of the great interior of America. To the French and Belgian officers and missionaries must be given the credit for the most extended and daring explorations and surveys.

From the Indians among whom they sojourned they derived a vague knowledge of a great river flowing to the west, and upon nearly all the maps of America published during the early part of the eighteenth century may be found one or more such rivers represented. These rivers were given the name of *River of the West*, *River Thegaya*, *River Aguilar*, or some other, and were represented on the authority of accounts received from the Indians, or of erroneous or fabulous accounts of voyages along the North Pacific coasts.

Capt. Jonathan Carver, of Connecticut, spent the years 1766–'67–'68 among the Indians of the Upper Mississippi, and ten years later published an account of his travels, &c., in which he several times speaks of this as the great river of the west, or the Oregon, or Origan.

This is the first mention of the name Oregon. Mr. Greenhow says that much labor has been expended in vain to discover its meaning and derivation, and that it was most probably invented by Carver.

Although it does not seem possible to determine with certainty the origin of the word Oregon, it does not seem at all probable that it is a meaningless word invented or coined by Carver.

It has been claimed, and not without some reason, that it is from the Spanish word *Oregano*, the wild marjoram, *Origanum Vulgare* L, found growing in abundance along the coasts. It also may be from the Spanish word *Oreja*, the ear, or some of its derivatives, as *Orejon*, or *Orejones*, signifying dried fruits, and in the familiar language of Spain signifies *dog's-ears*, an *ear-pulling*, &c. A derivative word *Orejera* signifies a sort of ear-ring worn by Indians.

Carver did not write his book until ten years after he finished his travels and returned to England, and it is very probable that he heard the word or saw it in some Spanish chronicle and made use of it in his own narrative.

The expedition which left England in 1776, under the command of the intrepid navigator, Capt. James Cook, made known to the world the immense profits which could be derived from the commerce in furs between the Pacific coasts of America and China. In this trade were soon engaged a number of ships sailing under various flags and commanded by men of different nationalities, but principally by Englishmen.

Captain Meares, sailing in 1788 under the flag of the British East India Company, searched for Hecata's river of Saint Roc, but, instead

of finding the river, he found in the place where it was located on the Spanish charts a large bay, which he was unable to enter and to which he gave the name of Deception Bay; to the northern promontory he gave the name of Cape Disappointment, which name it still bears. He explicitly denied the existence of any such river as the Saint Roc.

In the summer of 1787 the *Columbia* and *Washington*, commanded by John Kendrick and Robert Gray, were fitted out in Boston for trade on the northwest coast. The Washington, commanded by Gray, made the northwest coast in August, 1788, near the forty-sixth degree of latitude, where she came near being destroyed in her efforts to enter an opening, which was most probably the mouth of the great river afterwards called by her commander the Columbia.

Gray remained on the coast during 1789, engaged in explorations and trading voyages, in the course of which he "entered and sailed up a great arm of the sea for fifty miles in a southeast direction and found the passage five leagues wide." This was the Strait of Juan de Fuca, discovered by the old Greek pilot in 1592, and seen, but not entered, by Berkeley in 1787.

In the latter part of the year (1789) Gray sailed in command of the Columbia to China, which he reached in December, and from thence sailed around the Cape of Good Hope, and arrived in Boston August 10, 1790, having carried the flag of the United States for the first time around the world.

Kendrick, in command of the Washington, remained and made examinations of the northwest coasts, and must be considered as the first person belonging to a civilized nation who sailed entirely through the Straits of Fuca after its discovery by the Greek pilot in 1592. He sailed to the eastward through the Strait of Fuca, then northwestward through the Straits of Georgia and Queen Charlotte's Sound to the Pacific, thus establishing the insulation of Vancouver Island.

In September, 1790, Gray, still in command of the Columbia, sailed from Boston, and in June, 1791, arrived on the northwest coast and remained, trading and exploring about Queen Charlotte's Island, until the spring of 1792, when he took his departure on an expedition southward along the coast. Returning to the northward, he, on the 29th of April, met Vancouver near the Straits of Fuca, and, among other things, informed him that in the latitude 46° 10′ he had been off the mouth of a large river, where the outsetting current was so strong as to prevent his entering it, although for nine days he tried to do so.

Vancouver and his lieutenant, Broughton, had just finished a very careful examination of the coast from Cape Mendocino to the Straits of Fuca; had noticed the Deception Bay of Meares, in latitude 46° 19′, and that here the sea changed from its natural to river-colored water, but did not consider the opening worthy his attention, and from the line of breakers deemed it inaccessible. He records his emphatic disbelief in

the existence of any safe port or large river along the part of the coast examined by him.

After parting with the English ship, Gray sailed along the coast to the south, determined to solve the question of the existence of the river. He went first into a safe and commodious harbor, now known as Gray's Harbor, and on the 11th of May he entered his desired port, running in, with all sails set, between the breakers (which had been pronounced impassable by Meares and Vancouver), and came to anchor in a large river of fresh water, ten miles above its mouth. He afterward, keeping along the northern bank, proceeded up the river for twelve or fifteen miles further, at which point, having taken the wrong channel, he turned back and spent a week in vain attempts to get back to sea before he succeeded.

On leaving the river, Gray gave it the name of his ship, the *Columbia.* Attempts have been made to fix upon it the name of Oregon from Carver's indistinct narrative, but have not succeeded. Gray gave the name of Point Adams to the southern point and Cape Hancock to the northern point at the river mouth.

This first discovery and entrance into the Columbia River by Gray, an American, gave the United States their principal claim to the territory drained by the river, and is thus a very important episode in the history of the river and of the country known as the Oregon region.

After leaving the Columbia, Gray fortunately met with the Spanish Commander Quadra, to whom he gave an account of his discovery and a chart of the mouth of the Columbia. In the controversy which afterward arose between the United States and Great Britain for the possession of Oregon, "it was this chart that outflanked the scheming of Vancouver and gave the broad estate of silver-tented Hood to free America."*

In October of the same year, 1792, Lieutenant Broughton entered the mouth of the Columbia in the Chatham and found there the brig Jenny, from Bristol. Broughton examined the river for about one hundred miles from its mouth, going up it in a small boat to about where the town of Vancouver now stands.

The discoveries of Gray, Vancouver, Broughton, Kendrick, and others, added largely to the knowledge of the country and attracted the attention of mariners and merchants.

Many vessels were now employed in carrying on the trade with the Indians. This trade, owing to the peculiar relations existing among the nations of Europe and their colonies, both with each other and with China, was almost entirely in the hands of citizens of the United States, and it is certain that previous to the establishment of Astoria in 1811 many vessels entered the Columbia.

After the transfer of the French possessions in America to the United States in 1803, the government of our country, under the enlightened

* Simpson.

and far-seeing Jefferson, became imbued with the desire of obtaining an accurate knowledge of its new western territory, with a view to the ultimate objects of colonization and commerce. In furtherance of this desire a number of expeditions were fitted out, whose explorations resulted in geographical discoveries of great importance.

By far the most important of these expeditions was the one intrusted to the command of Captains Lewis and Clarke, who were directed to ascend the Missouri, cross the Rocky Mountains, and trace the Columbia, the great river of the west, from its sources to the sea, and determine thus the most direct and practicable water communication for the purposes of commerce.

Probably no two men ever had a task given them of greater difficulty and magnitude, and involving the exercise of more skill, wisdom, intrepidity, discretion, and all manly attributes, and which, after an "experience epic in the grandeur of its unwitnessed valor," was carried to a complete and successful termination, than had these two men, Captains Lewis and Clarke.

The history of man furnishes few instances in which so much has been added in so short a space to the geographical knowledge of the world, and which has stood the test of time like that gathered and recorded by them. These travelers began the ascent of the Missouri in 1804 and spent the winter of 1804–1805 at Fort Mandan. The next season they continued up the Missouri to the three forks, called by them Jefferson, Madison, and Gallatin; they continued on up the Jefferson Fork and crossed over to the west and struck the Salmon River. This they found they could not descend, owing to its deep cañons, falls, and rapids, and so they went north, and after great suffering among the mountains they reached the Kooskooskee or Clearwater, where it is navigable for canoes. They made boats and proceeded down this stream to its junction with the Snake River, and on down this great branch to the main Columbia, which they explored to its mouth, reaching the Pacific in December, 1805. They remained during the winter of 1805–1806 near the mouth of the Columbia, and returned the next season by nearly the same route by which they had come.

Thus, only seventy-five years ago, was this river in its upper portions first navigated by white men. Their dug-out canoes are now replaced by stately steamers bearing great loads of precious grain from the most fertile regions on the earth, then occupied and roamed over alone by savage men and beasts.

For crossing the plains and mountains the iron horse has replaced its more frail and fleshly brother, and the scream of steam is now heard proclaiming the doom of savagery and the advent of civilization and refinement.

Mr. Astor's attempt to found a fur-trading empire on the Columbia and its tributary lands and streams is the next important era in the history of the Columbia. One expedition was sent by sea and one by land.

The first, in the ship Tonquin, sailed from New York September 8, 1810, and arrived at the mouth of the Columbia on the 22d of March, 1811, and entering it the party established their fort and trading post, to which they gave the name of Astoria.

The land expedition under Mr. Wilson P. Hunt was organized at Montreal, Mackinaw, and Saint Louis, which latter place it left October 21, 1810. The party spent the winter of 1810–'11 on the banks of the Upper Missouri, and from thence started in the spring of 1811 across the mountains and reached the headwaters of the Snake River, down which they tried to make their way. After complicated and almost incredible sufferings from hard travel, cold, thirst, and hunger, and annoyances from the insolence and craft of the Indians, surpassing all that is told of any equally well appointed body of travelers west of the Rocky Mountains, finally, on January 21, 1812, the portion of the original party remaining with Mr. Hunt came in sight of the Columbia River near the mouth of the Umatilla, and proceeding down it arrived on the 15th of February at Astoria.

It was not, however, until the 11th of May, 1812, that all the straggling members of the party got to their desired haven at the mouth of the great river.

While the land expedition was thus struggling painfully across the mountains and down the great southern branch of the Columbia, and the Astorians were engaged in preparing and laying out their future homes and trading with the neighboring Indians, the Northwest Fur Company had not been idle.

In 1810 an expedition under Mr. David Thompson, the astronomer and surveyor of the company, started from Canada with the hope of reaching the mouth of the Columbia before Astor's parties, of whose plans they were cognizant, and forestalling them in the occupation and trade of the country bordering the river. This party experienced so many difficulties and delays in crossing the Rocky Mountains that they were obliged to winter near the headwaters of the Columbia under the fifty-second parallel of latitude.

In the spring of 1811 they hastened down the river, building huts and raising flags at various places by way of taking possession of the country, and arrived at the mouth of the river on the 15th day of July, and found, much to their chagrin, that they had been forestalled by Astor's sea party.

Mr. Thompson and his party were the first white persons who had navigated the Upper Columbia, or traversed any part of the country drained by it.

Eight days after Mr. Thompson's arrival at Astoria Mr. David Stuart, one of the Astoria partners, with a detachment set out on a voyage up the river to establish a trading post in the interior. The place selected was the level prairie at the junction of the Okinakane and Columbia, which point was reached on the 1st of September, 1811. This post was

occupied for many years and was an important center of the fur trade. Now, however, no white men live near it, and it has been so completely destroyed that not a vestige of it remains.

In the following year, 1812, Fort Spokane, or, as it was commonly designated, Spokane House, was established by a party of Astorians under Mr. Clarke. This was situated near the junction of the Spokane and Little Spokane Rivers, as they are now designated.

Trading posts had previously been established by the Northwest Fur Company in the Flathead and Kootenay countries.

From Fort Okinakane and Spokane House, parties supplied with goods were sent out to trade with the Indians and collect furs, and to examine the country, particularly in reference to its fur-producing qualities and the character and number of its Indian inhabitants. In the autumn of 1811, after building the fort, Mr. Stuart left Okinakane and proceeded up the river of that name, tracing it to its source; he then crossed over to the Thompson River and wintered among a powerful nation called the She-Waps (now written Shuswaps). He returned to Fort Okinakane in March, 1812, and brought the first authentic information concerning the country which he had visited. From Spokane House Mr. Pillet conducted an expedition into the Kootenay country and gained much information concerning it. As illustrative of the hostility existing between the different fur companies it is recorded that he met and fought a duel with Mr. Mantour, the agent of the Northwest Company—pistols at six paces—in which affair neither were mortally wounded.

Mr. Farnham, from the same post, crossed the Bitter Root and Cœur d'Alêne Mountains, and visited the Selish or Flat Head country, seeing much of the region and adding largely to the store of knowledge concerning the basin between the Rocky and Bitter Root Mountains.

Mr. McKenzie established a temporary trading post among the great Sha-hap-tan or Nez Percé nation, and learned what he could about the headwaters of the Snake. These Indians, however, were found to be more devoted to war and buffalo hunting than to the hard drudgery incident to the taking of beaver. They were rich in horses and able to procure all their necessities by the sale of their steeds. In consequence the trading post among them was abandoned.

A number of books have been written and published giving accounts of the adventures and expeditions of these early fur traders, which contain much valuable information, and are interesting reading as giving the first accounts of large portions of the country. The most noteworthy of these works are the volumes of Alexander Ross on the "*Fur Hunters of the Far West*," Ross Cox's "*Adventures on the Columbia*," "*Franchere's Narrative*," Ross's "*Adventures of the first settlers on the Oregon or Columbia River.*" All these men were clerks and partners in the fur companies of whose transactions they treat. To these must be added

Astoria, Washington Irving's charming account of Astor's great enterprise.

In the fall of 1813, the fortunes of war then raging between the United States and Great Britain compelled the transfer of the Astor or Pacific Fur Company to the Northwest Fur Company, which, from this time, carried on the trade with the Indians which had been commenced by the former.

From this time onward for many years the history of the Columbia River country is the history of the operations of the Great Northwest and Hudson's Bay Companies, and of the efforts of private parties to get a share in the profits of the fur trade.

The quarrels continually going on between the companies and private parties caused attention to be directed to the country, and it began to be talked about, and emigration schemes to be discussed.

In 1818 Fort Nez Percé, or Walla Walla, was built on the Columbia, about eleven miles below the Snake, where Wallula now stands. This it was designed to make the headquarters of the fur trade east of the Cascade Mountains.

In 1821 the Hudson's Bay Company and the Northwest Company were merged into one, and the united company then worked with all its energy, pushing its trade, and holding its monopoly against all comers.

In 1824 the headquarters of the trade was removed from Fort George or Astoria to Vancouver, and the old Fort Vancouver was built. This was the chief and central point of the commercial transactions of the entire Northwest for many years.

Missionaries began now to arrive and settle among the Indians, and a few adventurous emigrants to drift in, some by sea and some by land.

The Government of the United States sent agents to examine into and report upon the condition and prospects of this western Columbian country, and the expediency of erecting a military and naval establishment on the Columbia began to be discussed among the authorities at Washington.

The geographical knowledge of the country was greatly augmented in the years 1832–'33–'34 by the examinations and surveys of Captain Bonneville. He spent the winter of 1832–'33 about the headwaters of Salmon River, and learned a great deal about that section of the country. During the winter of 1833–'34 he visited the Columbia, passing down the Snake River Valley through the Grand Ronde and over the Blue Mountains to Walla Walla. He returned to Bear River, and again in 1834 he made a second visit to the Columbia.

Captain Bonneville's maps are the first to correctly represent the hydrography of the regions west of the Rocky Mountains, and determine the existence of the great interior basins without outlets to the ocean, to prove the non-existence of the Buenaventura and other hypothetical rivers, and to reduce the Willamette to its pr. per length.

The exploring expedition under Commander Charles Wilkes of the

United States Navy filled up with authentic information another great blank in the maps of this western country.

The expedition arrived in Oregon in 1841, when a party under Lieutenant Johnson was dispatched up the Nisqually, crossed the Cascade Mountains near Mount Ranier, and reached the Columbia near the mouth of the Wenatchee. Thence they proceeded up the river to Fort Okinakane, on to the mouth of the Spokane, and up to Fort Colville. They then turned south, and going through the Colville Valley, visiting Walker and Eel's Mission, and reached the Kooskooskia or Clearwater about forty miles below where Lewis and Clarke struck it, and keeping to the west went to Fort Walla Walla. From Walla Walla the party kept up the Yakima River to its source, and crossing the mountains reached the Nisqually and the point from whence they started.

In this expedition the Columbia was surveyed up as far as the Walla Walla, and a party was sent up the Willamette Valley, and crossed over to the sources of the Sacramento, which river they followed down to the Bay of San Francisco.

The next great explorer to appear upon the scene is Capt. John C. Fremont. This active, energetic, and intrepid man, who has been dubbed the *Great American Path Finder*, and whose travels and adventures have been more talked about and written about and popularized than have those of any other American explorer, in 1843 crossed over from the Great Salt Lake Basin to the headwaters of the Snake River. He followed on down this and Boisé River to the mouth of the latter, where he crossed the Snake and kept on down it to Burnt River, up which he proceeded to its sources, and then crossed the Blue Mountains and entered the valley of the Walla Walla, and followed it to its junction with the Columbia. From this point, at which was situated old Fort Walla Walla, or Nez Percé, he traveled by land and water to Fort Vancouver, where he arrived in November, 1843.

Leaving Vancouver after a short stay, Fremont proceeded to the Dalles, and thence up the valley of the Des Chutes until near its head, when he left it and crossed over a low timbered country into the upper portion of the Klamath Basin. Here he turned east and visited Summer Lake, Lake Abert, and Christmas, or Warner Lakes, and thence on to Pyramid Lake and the south. The latter part of his journey was performed amidst the snows and cold of winter, and his party performed almost incredible labor, and suffered terrible hardships.

During all the long years in which the Oregon region was being first explored and settled, a dispute had been going on between the United States and Great Britain in regard to its ownership, which at different times waxed so fierce that it threatened war between the two countries.

Fortunately an arrangement was finally arrived at, and the boundary line between the British and American possessions fixed at the forty-ninth parallel of latitude. On the 15th of June, 1846, the treaty was signed which gave to our country the extensive Oregon region, com-

posing the present State of Oregon, and the Territories of Washington and Idaho. This great region was organized into a Territory by act of Congress, approved August 14, 1848, and on March 3, 1849, General Joseph Lane, the first Territorial governor, arrived at Oregon City, and proclaimed the inauguration of the new régime.

About this time strange rumors began to circulate through the populous portions of the East; rumors from the regions of the setting sun, far beyond the Rocky Mountains; rumors of rivers and mountains of gold in the beautiful sunny land so lately wrested from the swarthy, cruel Spaniards. Days and months passed on and these rumors, ever increasing in their grandeur, flew to the East, and soon there were to be seen countless multitudes slowly and laboriously crossing the plains and mountains, or crowded in ships, coming by Cape Horn or the Isthmus, all coming with inflamed imaginations to worship at the fateful golden shrine.

In the minds of those inclined to wander, there was then no room for Oregon and her unromantic prospects; the lust for gold and swift and countless riches inspired all and left place for nothing else. So Oregon and her noble river were left waiting, waiting during many a month and year, for the allurements of her golden southern sister to prove to many a myth and a delusion.

Soon, among the comfortless, hungry, blood-stained camps of California, it began to be talked about that gold could be procured from the soil and amidst the plains and forests of Oregon; gold procured, not in a wild and burning struggle, at the expense of all noble and Christian attributes, but by honest, faithful labor, sure of reward, amid the comforts and quiet joys of home, surrounded by the refining and loving care of woman. Then the tide of emigration turned Columbia-wards, and it has never ceased; those who came, came as the Pilgrim Fathers to build up a substantial empire founded on the only true and certain foundation, the honest homes of honest men and women.

And now the curtain rises again, and another grand idea is uplifted and takes hold of the minds of all men who are interested in Oregon, and in the unity and prosperity of our whole country. It is the idea of uniting the East and the West, wedding them together by the iron bands of a trans-continental railroad. To find a proper route for the iron horse to travel through the great interior country, government aid was invoked and cheerfully given, and in 1853 was organized the Pacific Railroad surveying expedition, which, more than all others, has added accuracy and extent to our knowledge of the geography of the northern and northwest portions of the United States.

To Gov. I. I. Stevens, of Washington Territory, was assigned the general charge of the surveys between the forty-seventh and forty-ninth, and to Capt. George B. McClellan, of the Corps of Engineers, was assigned the western division, whose duties were to explore the passes of

the Cascade Range, meeting the eastern party between that range and the Rocky Mountains.

The reports and maps of the Pacific Railroad Surveys are embraced in thirteen quarto volumes, and contain a vast amount of authentic and valuable information.

During the continuation of these surveys, in 1853–'54–'55, the Columbia itself and many of its branches were examined and surveyed.

Lieut. John Mullan, in charge of one of the surveying parties, operated extensively in the region lying between the Rocky Mountains and the Bitter Root Mountains, and down by the Koos-koos-kia to Walla Walla.

Lieutenant Saxton, accompanied by Lieuts. Arnold and Macfeely, went from the Dalles via Walla Walla, Palouse, Spokane, and Cœur d'Alêne Rivers to Clarke's Fork, Bitter Root Fork, and thence to the mission of Saint Mary. Lieut. Macfeely returned to the Dalles by the Nez Percé trail up the Bitter Root and westward through difficult mountains to the Koos-koos-kia.

Lieutenant Donelson left Fort Benton and traveled in a southwesterly direction, crossing the main range of the Rockies at Cadotte's Pass, thence down the Blackfoot Fork to Saint Mary's. He then passed from the Bitter Root to the Jocko, and, following the latter to its mouth, entered the valley of Clarke's Fork, followed it to a point twelve miles below Lake Pend d'Oreille, crossed to the Spokane River, and proceeded about twelve miles west, where he joined Captain McClellan's party. Thence following an Indian trail, crossing the Snake at the mouth of Palouse, the party went to Walla Walla.

Mr. A. W. Tinkham and Mr. F. W. Lander made reconnaissances from Fort Benton westward to the Columbia waters. Dr. George Suckley descended the Bitter Root, Clarke's Fork, and Columbia Rivers in a canoe, making several portages and arriving safely at Vancouver.

The main party of the western division under Capt. George B. McClellan left Vancouver and proceeded in a northerly direction to the Cathlapoot'l; thence in an easterly direction south of Mounts Saint Helens and Adams; thence northwest, crossing the Atahnam, Nachess, and Wenass Rivers, up the valley of the Upper Yakima to the Yakima Pass, which was examined; thence he proceeded to Kittitas; thence north to the Columbia; thence up its right bank to the Okinakane, which was examined up to Osooyoos Lake. From Osooyoos Lake the party crossed the dividing ridge and reached Kettle River, which they followed to the Columbia at old Fort Colville; thence they followed up the Colville Valley and over to the Spokane, where, being joined by Governor Stevens, the whole party proceeded to Walla Walla.

Lieut. S. Mowry examined a route leading from Wenass River in a southerly direction to the Dalles of the Columbia. Lieut. H. C. Hodges joined McClellan's party at Kittitas, having marched from Fort Steilacoom. His course was easterly to the Stkamish River; thence along that stream to the Nachess Pass; thence along Nachess River.

Mr. Tinkham, with ten Walla Walla Indians, in January of 1854, crossed the Cascade Mountains by the Snoqualamie Pass and followed down the Snoqualamie River to Seattle.

Lieutenant Grover made a winter journey in January and February, 1854, with a dog-train, from Fort Benton, via Fort Owen, Clarke's Fork, and Fort Walla Walla, to the main Columbia River.

In the fall of 1854 Mr. Doty, with a party, left Fort Benton for Olympia. He went up the Teton River and crossed over to the Bitter Root River. Leaving the Bitter Root Valley, he proceeded by way of the Saint Regis Borgia River to the Cœur d'Alêne Mission, whence he pursued a southwesterly course to Fort Walla Walla. Leaving Walla Walla, he went up the Columbia to the Yakima River; thence up that stream to its source; thence through the Yakima Pass to Olympia.

In 1855 an exploration and survey for a railroad route from the Sacramento to the Columbia was made by Lieutenants Williamson and Abbot, of the Topographical Engineers. As a matter of curiosity, I may here state that the escort of this expedition was commanded by Lieuts. H. G. Gibson, George Crook, J. B. Hood, and P. H. Sheridan, all soon to achieve great distinction in the civil war. The Des Chutes and Willamette Rivers and their valleys were very carefully examined by parties of this expedition.

A great mass of information concerning the geography of the Columbian Basin and other portions of the great west had been collected and was on file in the departments at Washington. Most of this was in the form of reconnaissances, and few of these possessed any great accuracy, and the geographical positions were very uncertain and ofttimes conflicting.

To Lieut. G. K. Warren, of the Corps of Engineers, was given the task of compiling all this information on a map of the country between the Mississippi River and the Pacific Ocean. His instructions were to—

> Carefully read every report and examine every map of survey, reconnaissance, and travel which could be obtained, to ascertain their several values and to embody the authentic information in the map.

This duty he completed, and submitted his report on the 1st of March 1858. His task involved an immense amount of patient, painstaking research and care, combined with the soundest judgment, and was most successfully performed, and the map was for many years the foundation for all the maps of the great west.

Since the publication of General Warren's map the knowledge of the geography of the Columbian Basin has increased, not so much by any new discoveries of magnitude as in accuracy and detail.

The land surveys under the Interior Department have added much to our knowledge of the settled portions, and the scouts, reconnaissances, and itineraries of officers of the Army have added much more to our knowledge of the settled portion and of the wild regions through which

the Army is generally obliged to move in its conflicts and dealings with the Indians.

In the recently-published map of the Military Department of the Columbia, which embraces nearly all of the Columbian Basin lying within our Territory, compiled by me while on duty as chief engineer of the department, I have given all the topographical and economic information which I could obtain. It is founded on the most recent War Department map published by the Chief of Engineers; the Land Office maps and land surveys up to 1879 and '80, the Northern Pacific and other railroad surveys, the map of Lieut. Robert Fletcher, illustrating General Howard's Nez Percé campaign, numerous reconnaissances and itineraries of officers which had never been compiled, and information derived from conversations with officers and others familiar with portions of the country. To this was added the surveys made by myself and assistants in 1878–'79 and '80. These surveys extend over the country in Southern and Central Oregon east of the Cascades and lying along the Des Chutes and John Day rivers and Klamath, Summer, Abert and Warner Lakes; the Great Plain of the Columbia in Washington Territory and Idaho, especially the hitherto little-known regions of Moses Lake, Moses Coulée, and the Grand Coulée, the quadrilateral lying between the Snake, Salmon, Clearwater, and South Fork of the Clearwater in Idaho; Southwestern Oregon; and the regions of the Skagit and Sauk rivers in Washington Territory.

A great deal of knowledge is obtained each year from various sources, and it is hoped that an edition of the map, with all important changes, may be published every two years at least.

In compiling this map I could not help being struck with the great lack of information concerning certain portions of the country which it is intended to represent. There are large areas containing many hundreds of square miles which are comparatively unknown, and what little is known is of the most inaccurate and untrustworthy character, and that which is put upon the maps is largely hypothetical.

The regions to which I would particularly allude are the Olympic Mountain region; the region bounded on the north by the international boundary line, on the east by the Rocky Mountains, on the south by the Columbia and Wenatchee rivers, on the west by Puget Sound; the regions of the Saint Joseph and Clearwater rivers in Northern Idaho; and especially the regions of the Salmon, Weiser, and Payette rivers in Central Idaho.

There are thousands of square miles in these regions of which no accurate information has ever been obtained. These regions may at any time become the theater of Indian wars in which a certain knowledge of the country would be of inestimable value and save the government, in money alone, more than it would cost to make a satisfactory survey of all the unknown portions.

Commercial enterprises are pushing their way into these regions, im-

portant transportation routes may pass through them, and all branches of the government as well as her private citizens and corporations will soon require a complete and thorough knowledge of the whole country.

I therefore call attention to these unknown and unsurveyed regions, and the need of money to carry on the necessary examinations and surveys therein, and to fix the geographical positions of a number of important and central points in the department by astronomical observations and computations.

CHAPTER IX.

THE GEOLOGICAL HISTORY OF THE CASCADE MOUNTAINS AND THE COLUMBIA RIVER.

In order to understand and fully comprehend the various features of this country, it is highly desirable and essential to know its geological history, its building up, and the changes which have taken place reducing it to its present condition. This is depicted with great distinctness upon its face and in its deep cañons, and is easily read by the student of nature.

If we turn back to the first pages of the geological history of this continent, we shall see that at the beginning of the Paleozoic era nearly all our present land was under water, not having yet emerged from the primeval seas. In the area of the United States two strips existed, forming the nuclei about which has been built the land as we now see it. One of these strips was the Appalachian Mountain chain; the other the Rocky Mountain chain. With the former we have nothing to do except to draw from it lessons applicable to the latter. By the Rocky Mountain chain is not meant simply a range of peaks, but a grand and wide belt of country in form of a gigantic fold, from which, in later times, the present ranges and peaks have been sculptured by erosion. All to the west of this chain, where now stand the Sierra Nevada, Cascade, and Coast ranges, was buried beneath the ocean. Many rivers existed then eating away at the western slopes of this great uplifted range, and depositing the débris along the shores of the pristine sea, forming thus sedimentary deposits of great depth and extent.

This deposition of sediment went on during the Paleozoic era, and the whole Triassic and Jurassic periods of the Mesozoic era until an enormously thick mass of off-shore deposits had accumulated.

This great marginal sea-bottom became the theater of intense aqueo-igneous action in its deeply-buried strata, producing a line of weakness which, yielding to the horizontal thrust produced by the secular contraction of the interior of the earth, was crushed together and swollen up into the Sierra Nevada and Cascade ranges at the end of the Jurassic period. The Cascade range thus produced was far from presenting

any similarity to the range as we now see it. As far as can be ascertained, it was a range of not very great height, but probably higher to the south than to the north. This range existed for unknown centuries, and in its turn was the theater of erosion and of plant growth, and was roamed over by the wonderful extinct animals of the Cretaceous and Tertiary periods. It was not yet covered by the great lava flow and mountain range soon to be described, but instead by forests of conifers and oaks.

Where the Columbia River breaks through the Cascade Mountains there are found, beneath the overlying lava:

First. Along the water's edge, and for about fifteen feet upward, a very coarse conglomerate of rounded porphyritic pebbles and bowlders of all sizes up to five or six feet in diameter, cohering by an imperfectly lithified earthy paste.

Second. Above this conglomerate is a very distinct, irregular, old ground surface bed, in which are found silicified stumps, with their roots spreading out over twenty feet in diameter and penetrating into the bowlder material beneath and evidently *in situ*. This is undoubtedly an old forest ground surface.

Third. Resting directly on this ground surface, and therefore inclosing the erect stumps, is a layer of stratified sandstone, two or three feet thick, filled with beautiful impressions of leaves of several kinds of forest trees, possibly of the very trees about whose silicified bases they are found. This layer is not continuous, like the ground surface on which it rests.

Fourth. Above this stratified leaf-bearing layer, rests a coarse conglomerate similar to that beneath at the water-level. Scattered about in the lower part of this upper conglomerate and in the stratified sandstone, and sometimes lying in the dirt-bed beneath it, are fragments of trunks and branches of oaks and conifers, in a silicified or lignitized condition. They are evidently silicified drift-wood.

Fifth. Above this last conglomerate, *and resting upon it*, rise the layers of lava, mostly columnar basalt, one above another, to a height of more than 3,000 feet.*

All these facts were noted and studied by Professor Le Conte, who drew the following order of events from them.

First. The region of the Columbia River was a forest, probably a valley, overgrown by conifers and oaks. The subsoil of this forest was a coarse bowlder drift produced by erosion of some older rocks.

Second. By excess of water, either by floods or changes of level, the trees were killed, their leaves shed and buried in mud, and their trunks rotted to stumps.

Third. Tumultuous and rapid deposit of coarse drift containing drift-wood, covered up the forest ground and the still remaining stumps, one hundred, perhaps several hundred, feet in thickness.

Fourth. The surface thus formed was eroded into hills and dales.

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* Professor J. Le Conte, in American Journal Science and Arts, 1874, Volume VII.

Fifth. Then followed the outburst of lava in successive flows, perhaps for a long period of time, and the silicification of the wood and the cementation of the drift by the percolation of the hot alkaline waters containing silica, as happens so commonly in sub-lava drifts.

Sixth. Finally followed the process of erosion, by which the present stream channels, whether main or tributary, have been cut to their enormous depth.

The great masses of sediment sent down to the sea from the primary Cascade range, forming a thick off-shore deposit, gave rise in its turn at the end of the Miocene to the upheaval of the Coast range, and, coincidently therewith, the Cascade Mountains were rent along the axis into enormous fissures from which outpoured the grand lava floods, building higher the mountains, and covering the country for great distances.

This is probably the grandest and most extraordinary lava flow which ever took place in the world, covering as it does an area of about 200,000 square miles of the Western States and Territories. Commencing in Middle California as separate streams, in Northern California it becomes a flood, completely mantling the smaller inequalities, and flowing around the greater inequalities. In Northern Oregon and Washington it becomes an absolutely universal flood, beneath which the whole original face of the country, with its hills and dales, mountains and valleys, lie buried several thousand feet. It covers the greater portion of Northern California and Northwestern Nevada, nearly the whole of Oregon, Washington, and Idaho, and runs far into British Columbia on the north. The average thickness of this tremendous flood is probably not far from 2,000 feet. This is shown where the Columbia, Des Chutes, Snake, Salmon, and other rivers cut through it. Its greatest thickness is not less than 3,700 feet, as demonstrated by Professor Le Conte.

To produce this enormous thickness many successive flows took place, and very long periods of time must have elapsed during which the volcanic actions were going on.

Along the Des Chutes, on the Snake River both above and below Lewiston, and on the Columbia below Rock Island Rapids, and in other places, the columnar basalt lies in horizontal layers, well-marked plains interrupting the continuity of the vertical columns. Magnificent examples of this structure are found in the basalts of the Cascade range. In the Grand Coulée the basaltic walls are from 300 to 600 feet in height, and between some of the layers there is a well-marked stratum of soil, evidently formed during a period between two successive flows of lava by the disintegration of the lava rock.

During this long period of the Cascade eruptions, the Coast range was being slowly elevated, and became, in its turn, the theater of local volcanic action. In all probability this local action was not very severe, except perhaps in the case of the Olympic Mountains and those in Northern California and Southern Oregon.

If the theory of the formation of mountain chains by the aqueo-igneous action taking place in deep deposits of sediment on marginal sea-bottoms is true, it is to be expected that at some time there will be another range elevated from the Pacific to the west of the Coast range; and if this latter follows the example of its prototype, the Cascades, it will give birth to lava floods overwhelming the Willamette and all other valleys lying between the two ranges.

The period of the great fissure eruptions in the Cascades drew to a close by the fissures becoming blocked up; the volcanic action was concentrated in some few localities, and the period of fissure eruptions was changed to a period of crater eruptions. These crater eruptions continued for a long period, in some cases even unto our own times, and to them we owe the upbuilding of those lofty snow-clad peaks which seem to us to have been forever locked in the embrace of eternal winter.

Commencing at the southern boundary of Oregon, the first of these peaks is Mount Pitt, which I ascended in 1878, and found it a beautiful cone-shaped structure, composed entirely of volcanic rock, flanked on all sides by numerous outlying spurs and foot-hill ranges. About its base are several small lakes, probably of glacier origin. This peak I found to be 9,818 feet above sea level.

Forty miles north of Mount Pitt stands Mount Scott, the next prominent peak of the range. Between these two peaks the range is somewhat low, with several well-defined peaks however, the highest of which is Union Peak, directly west of Fort Klamath, and which is 7,298 feet high. The beautiful level basin, lying at the head of Klamath Lake, in which is situated Fort Klamath, is 4,108 feet above the sea. Traveling along on the eastern slopes of the Cascades we found the soil to be composed of very light volcanic sand and ashes, interspersed with basaltic bowlders, and with here and there an exposed mass of rock resembling a trap dike.

Mount Scott, which we found to be 9,016 feet above the sea, has the same general features which characterize all the Cascade Mountains in the southern part of the range. It is of volcanic origin, and is covered on its eastern side with the ashes and light débris which have been carried over from the west, and which form a comparatively easy slope to the summit. On the west the bluffs are almost perpendicular walls of igneous rock, ragged and torn, among which nestle great masses of snow, sheltered from the summer sun, and forming reservoirs of water which irrigate beautiful patches of green in the lowlands at their feet. To the southwest, following down along these walls, our gaze at last rested upon one of the most remarkable and interesting features of nature's handiwork. In the calm stillness of an exquisite summer's day, lying in the dense and lonely wilderness, we saw *Mystic* or *Crater Lake*, a great elliptically shaped basin of water which we estimated to be five miles long and three miles wide, with unbroken cliff walls varying from 500 to 2,000 feet in altitude, crowned with pines and firs. A little conical

island, like a cinder-cone, covered with scattering trees, is the only occupant of this weird lake. There is probably a subterraneous outlet of the lake in Sand Creek, which flows to the east, and is absorbed in the waters of Klamath Marsh. Mount Scott is undoubtedly a portion of the eastern rim of the ancient crater, the remainder to the west having been carried away by erosion, assisted probably by other causes. Crater Lake, with its conical island, occupies the center of the crater of this gigantic old volcano. The rim of the lake to the southwest has an altitude of 7,143 feet, and at this point the lake is about 500 feet below it.

It seems highly probable that along the eastern slope of the mountains, between Mounts Pitt and Scott, were formed the glaciers which, moving to the south, scooped out the Klamath Basin and the Klamath Lakes.

The portion of the mountain chain from Mount Scott on the south to Diamond Peak on the north was a region of numerous volcanoes and of very extensive local lava flows. It has a very high average elevation, and in it all the principal rivers of Western Oregon have their sources: the Willamette, running to the northwest; the Des Chutes running to the northeast; the headwaters of Klamath River, running to the south and breaking through the range and flowing to the west; the Rogue River, flowing to the southwest; and the Umpqua, to the west and north.

The great local outflow to the east forms the divide separating the headwaters of the Des Chutes from those of the Klamath system of waters, while the outflows to the west form the Calapooia Mountains, separating the Willamette from the Umpqua waters, and the mountains separating the Umpqua from the Rogue River waters.

Diamond Peak is 8,807 feet high, and is another typical high peak of the Cascade range. The peak itself gives evidence of being the southeast portion of an old crater rim, from four to seven miles in diameter, now very much broken away to the west and filled with a great mass of snow which has crevasses and partakes very largely of the nature of a glacier; I think it can truly be called a glacier on a small scale. About Diamond Peak are scattered here and there volcanic cones and little conical monticules, evidently parasitic volcanoes, and several fine lakes are seen from its summit, the largest of which is Odell Lake, the source of the main fork of the Des Chutes. This lake lies to the east of the peak, and is supplied by the melting of the great snow fields about the eastern portion of the Diamond Peak cluster. It is a very wild, romantically-beautiful sheet of water about five miles long and four wide. There is no grass on its borders, and the fallen timber, the bogs, and the dense thickets of brush and tamarack make it almost impossible for beasts of burden to reach its shores.

The main or west fork of the Des Chutes, issuing from Odell Lake, has cut for itself a deep and wide cañon among the eroded hills in which to flow. Following down this stream we came to where it opens out into a lake, surrounded by tree-covered cliffs, with bottom lands and mead-

ows of considerable extent, and extensive mud flats near the lake. Following around its western shore we found that it had no visible outlet. There were water-marks twenty feet above us on the lava bluffs of the northern and northeastern shores of the lake, and during the night we heard rumblings among the sharply-cut rocks composing the bluffs. We found the next day that these lava beds formed an impassable barrier, extending unbroken for about four miles to the north, and at their end we found foaming out from beneath the great angular bowlders the clear cold water that we had seen lose itself in the lake fifteen miles or more to the south.

The lava rock composing this barrier to the waters is extremely hard and close-grained, in fact almost obsidian, and is broken into irregular blocks with very sharp, clear-cut edges. It seems to have come from some volcano to the south, between the east and west forks of the Des Chutes. Its recent origin is shown by the fact of its having dammed up the stream after the latter had cut for itself a deep and wide cañon bed, and also by its having such sharp edges and unworn, new appearance, and having no accumulation of soil of any kind on its top.

That there were volcanoes away to the east of the Cascade range there can be no doubt. Mr. Karl observed well-defined craters and local lava flows in the Pauline and Walker Mountains, which are composed largely of obsidian. It is highly probable, and I believe that in time it will be demonstrated, that there were many volcano and fissure eruptions in the desert country of Southern and Central Oregon, and also within the limits of the Great Plain of the Columbia.

The Three Sisters are the next marked peaks of the range. There are, in fact, five well-defined peaks, and it seems highly probable that they are all portions of a grand old crater-rim, twelve miles in diameter, now broken and worn away. Further examinations will be required to demonstrate whether this is so or not. Various small volcanic cones are in their vicinity and lying between them and Mount Jefferson.

Mount Jefferson follows next and then Mount Hood, both being true volcanic cones.

Persons who have visited Mount Hood say that near its summit there are places where hot sulphurous gases still escape, and there are very many who claim to have seen smoke in large quantities issuing from this mountain. To the north of Mount Hood the Columbia River has dug its way through the Cascades, forming for its use one of the most magnificent mountain cañons in the world, cutting through the entire thickness of 4,000 feet of the overlying lava and far into the previously formed conglomerate upon which it rests.

To the north of the Columbia the range widens out considerably into a region of high, grassy mountain plateaus, of deep cañons, heavily timbered slopes, and volcanic peaks. Among the latter, now dead and shrouded in snow, but once alive with the terrible force of the volcano, are the huge, stately masses of Adams, Saint Helens, and Ranier.

The period of volcanic eruptions is just over in these mountains, if it can be considered as yet entirely over. In a journal of a journey across the continent to Oregon in 1843, the author states that Mount Saint Helens burst into a burning volcano in 1843, and was still burning on the 16th of February, 1844, when he described it thus:

> The mountain burned most magnificently—dense masses of smoke rose up in immense columns, and wreathed the whole crest of the peak in somber and massive clouds, and in the evening its fire lit up the flaky mountain side with a flood of soft yet brilliant radiance.

The account is in a printed report in the Portland Library, but the name of the writer is not given.

Judge Thornton, writing of Mount Saint Helen's, says:

> It is an active volcano, near 46° 29′. It is 9,550 feet high. This mountain was in a state of eruption in the year 1831. The fact is affirmed by Dr. Gassner, a distinguished naturalist of England, who was in Oregon at the time, as also by gentlemen connected with the Hudson Bay Company. With the exception of a slight red, lurid appearance, the day was dark, and so completely was the light of the sun shut out by the smoke and falling ashes that candles were necessary. The weather was perfectly calm and without wind; and during several days after the eruption the fires, out of doors, burned with a bluish flame, as though the atmosphere was filled with sulphur.
>
> Credible persons in Oregon have informed me that they have on several occasions since seen the fire and smoke of this volcano.
>
> The Rev. Josiah L. Parish, who is connected with the Methodist Mission in Oregon, informed me that he witnessed on one occasion a most remarkable eruption of the mountain. I regret, however, that, not having noted his relation in my journal, the date of the eruption and the principal facts connected with it have been obliterated from my memory by events to which my attention has since been called. I only remember that no earthquake was felt, no noise was heard, and that he saw vast columns of lurid smoke and fire shoot up, which, after attaining to a certain elevation, spread out in a line parallel to the plane of the horizon, and presented the appearance of a vast table, supported by immense pillars of convolving flame and smoke.*

The Rev. Samuel Parker, after describing the eruption of Saint Helens in 1831, remarks that—

> The Indians say that they have seen fires in the chasms of Mount Hood. Tilki, the first chief of the La Dalles Indians, who is a man of more than ordinary talents, said he had frequently seen fires in the fissures of rock in the last-mentioned mountains.

It is possible, however, that all this smoke and lurid glare, &c., might have come from great wood fires which have swept over large sections of the heavily-timbered country about Saint Helens and Mount Ranier.

This mountain region is very rough, being deeply cut up with rugged and steep cañons. On the western slopes it is covered with magnificent forests, principally of fir, the trees growing to an immense size. One tree lying on the ground was measured by one of Commander Wilkes's parties, and found, at ten feet from its base, to be thirty-five feet in circumcumference and three hundred feet long. The general elevation of the plateaus is from 3,000 to 5,000 feet above the sea; they are untimbered and covered with good grass. General McClellan reported that

*Oregon and California. Thornton, volume 1, page 256.

upon these mountain plateaus there was a great extent of beautiful and rich pasture land and a delightful climate.

On the eastern slopes the forests are more open, and consist of pine, fir, and white cedar.

The Nachess Pass has an elevation of 4,900 feet above the sea, and in the upper part of its course the Nachess River flows through a very narrow cañon four hundred feet deep, the walls being of solid, compact volcanic rock.

There have been several very large local outflows of lava from this part of the main range. Several of these go to make up the eastward stretching ridges forming the Simcoe Mountains. One of these lava flows extended to the east just south of the forty-seventh parallel, crossing the Columbia River and forming Saddle Mountain, which extends to the eastward and is lost in the general surface of the Great Plain.

The base of this Saddle Mountain outflow has all been worn away by the Yakima and Nachess systems of waters, and by the glaciers which must have come down scooping out the valleys of these rivers. Where the Columbia cuts through the outflow, just north of Priest Rapids, the bluffs are close together and stand out very prominently, viewed both from the north and south. The name of the "Sentinel Bluffs" was bestowed upon them.

The Yakima Pass, in about latitude 47½°, crosses the mountains in a region of deeply-embosomed beautiful lakes, the high cliff-like banks of which are crowned with splendid forests of pine, fir, and white cedar. These lakes in all probability owe their existence to glaciers which in former ages swept down the valley of the Yakima.

To the north of this pass very little is known concerning the main chain of the Cascades. It is a region of high and rugged mountains, more jagged and rough than the regions to the south, heavily timbered, and with a number of lakes and deeply encañoned streams. There seems to have been a volcanic center between the Yakima and the Wenatchee and lying about midway between the lakes of the Upper Yakima and the Columbia, from which outpoured a grand flood of lava to the east and south, forming the elevated range between the Wenatchee and the Yakima, known as the Wenatchee Mountains, and crossing the present channel of the Columbia and forming Badger Mountain on the east.

To the north of the forty-eighth parallel, which is about the line of the Spokane and the westward flowing portion of the Columbia, the country changes, becoming more independent in its mountain formations, and joins on the east with the earlier rock materials of the western spurs of the Rocky Mountains. Near the mouth of the Spokane, and crossing that river in a direction northeast and southwest, there is a great vein of granular magnesian limestone. Granite is also found in this vicinity underlying the basalt.

About the mouth of the Colville River the rocks are very largely composed of limestone. The Columbia at the Little Dalles and Ket-

tle Falls cuts through the limestone, which, to the west, seems to be covered up beneath hills of basaltic rock. This limestone is of good quality for building purposes and for lime.

There is a magnificent field for the geologist in the exploration of this region lying along the boundary line between the Cascades and the Rocky Mountains.

The natural consequence of the upbuilding of the Sierra Nevada and Cascade Mountains was the formation of a grand interior basin. The waters of this basin collected into secondary basins, some of very large extent, and were carried off by the rivers which have cut a way from the interior to the sea. The Columbia and its tributaries drained the northern portion of this great basin, and it was at this period, doubtless, that the Salt Lake of Utah assumed its old colossal proportions and found its outlet by the Snake River.

The commencement of the Tertiary period saw a great basin between the Rocky Mountains and the up-swollen primary range of the Cascades, especially in the region south of the Blue Mountains. This region was covered with fresh-water lakes and marshes, which were afterward overflown with lava. This lava has since become denuded in places, exposing the Tertiary beds, and furnishing evidence of the former condition of the region by the fossils found therein.

At the end of the Miocene the Coast range was upheaved, and the lava flows from the Cascade fissures commenced, but it was a long time before the lava flows reached the entire extent of the basins of Oregon, which continued to exist and be endowed with life away into the Pliocene period. The fossil beds of the John Day country and those near Christmas Lake in Southern Oregon are the principal ones that have been found in the country.

There is no evidence of which I am aware of any Tertiary basin north of the Blue Mountains. In the cañon of Snake River, a little below Lewiston, the basaltic layers, aggregating 2,000 feet thick, rest on granite. Above Lewiston, on the Snake, I found the same thing, as well as on the Upper Columbia near Lake Chelan, and the mouth of the Spokane.

It has been demonstrated to the satisfaction of geologists, and well stated by Professor Le Conte, that during the whole of the Tertiary period there was a gradual upheaval of the whole western half of the continent by which the axis, or lowest line of the great interior basin, was transferred more and more eastward to its present position, the Mississippi River. Probably, correlative with this upheaval of the western half of the continent, was the down-sinking of the mid-Pacific bottom, indicated by the coral reefs there existing. Also, as a consequence of the same upheaval, the erosive power of the rivers was greatly increased, and thus were formed those deep cañons in which they now flow. Thus the down-sinking of the mid-Pacific bottom, the upheaval of the Pacific side of the continent, and the down-cutting of

the river channels into their wonderful cañons are closely connected with each other.

We may picture to ourselves that, at the end of the Tertiary and the commencement of the Quaternary, the hundreds of volcanoes of the Cascades were belching forth their fire and smoke and liquid rock; the sea entering and occupying the regions of Puget Sound, the Willamette Valley, and all the intervening country; the Coast range, with here and there a center of volcanic activity; and in the interior a vast sea of cooling, hardening lava, through which the rivers ran in extremely deep channels, some of them deeper far than they are now. Extremely heavy rains prevailed, wearing away the mountains and washing the débris down into the Willamette Valley and all the low areas near the coast.

During the Quaternary period the high-latitude earth oscillations, producing the Glacial, Champlain, and Terrace epochs, are very well illustrated in this northwestern country, and especially in the Upper Columbia River.

During the Glacial epoch, when the mountains were being chiseled out by the moving ice, glaciers, large and small, swept in different directions across the great plain of the Columbia, grinding away at the solid rocks, partially filling the coulées, and strewing the country for many miles with a thick bed of bowlders.

Probably the largest of these glaciers was one which formed in the region of Pend d'Oreille Lake, swept to the southwest across the Spokane Plains, receiving the Cœur d' Alêne glaciers, and on across Hangman's Creek, the Four Lakes country, and still on to the southwest, spreading itself out like a great fan, and grinding up the rocks and spreading bowlders over the Spokane plains, and the area south of Badger Mountain and Crab Creek, and rendering its aid in forming the ancient Columbian Lake, to be hereafter noticed.

The top surface of these Spokane plains is composed of small pebbles and some loose soil; underneath, for a depth of many feet, the material is of rounded bowlders from six inches to one foot and more in diameter, closely jammed together and the interstices filled with soil.

During the Champlain epoch following, this Spokane plain was covered with a great lake, leveling off the upper surface of this bowlder formation, filling up the cavities with earth, and spreading over the top the layers of pebbles and soil. To the north of the plain there are several well-defined terraces, indicating the different sizes of this lake, from the greatest to the final and least size, after which it was finally drained away in the succeeding Terrace epoch by the Spokane River cutting its way through the obstructing rocks, and forming its deep cañon below.

A study of the Yakima country shows the existence of a grand glacier fed by numerous branches about the heads of the Yakima and Nachess, and their tributaries, and moving to the south and east.

Undoubtedly, throughout the Cascade Mountains, and the mountains of the north, there were many glaciers of great size. Lake Chelan was surely scooped out by a giant glacier. The Okinakane Valley has terraces, and gravel and bowlder beds, similar to those of the Spokane. The lake enlargements of the northern rivers, the Okinakane and Osoo-yoos lakes of the Okinakane, the Arrow lakes of the Columbia, the Kootenay lakes of the Kootenay, the Kaniksu Lake of the Vermillion, the Flathead, Pend d'Oreille, and Cœur d'Alêne lakes, all are probably of glacier formation.

In the southwestern portion of the Great Plain, south of Badger Mountain and Crab Creek, surrounding Saddle Mountain, and embracing within its limits the lower portions of the Yakima, Walla-Walla, and Snake Rivers, and Moses Lake, there is a region lower than the surrounding country, and which was undoubtedly a lake during the Champlain epoch. It is largely covered with rounded bowlders of all sizes embedded in a loose, light, powdery soil, very difficult for animals to traverse. It is also a region of great sand hills and dunes. Moses Lake is formed by the waters of Crab Creek being dammed up by a great sand drift which has placed itself across the old drainage channel of the creek. In the northern portion of this old lake bed the bowlders and loose soil rest upon the volcanic rock, which, a little further north, is exposed, and has large areas without any earthy covering. Just north of Saddle Mountain the waters of Crab Creek have cut deep cañons through the powdery alkaline soil. The walls of these cañons and ravines show plainly by their stratification the sedimentary method by which the land was formed. I was not able to find fossils of any kind in this place.

To the south of Saddle Mountain the Columbia has cut through this lacustrine sediment, forming at the White Bluffs perpendicular cliffs along the left bank of the river fifty to three hundred feet in height.

Judging from the character of the sedimentary deposits, this old lake seems to have been the receptacle of all the volcanic ashes and cinders scattered over the country, and washed into it by the rains and streams.

Along the right bank of the river the accumulations have all been carried away, leaving a low flat plain. I have endeavored to outline this ancient lake as far as practicable, and propose for it the name of Lake Lewis, after Capt. Merriweather Lewis, the leader of the exploring party which first saw any of the headwaters of the Columbia.

The Champlain and Terrace epochs have left very marked evidences of their existence in the cañon of the Columbia, especially in that portion of it between the Colville and Spokane rivers and the Okinakane and Wenatchee rivers. In both these sections of the river there are terraces of all elevations from five to five hundred feet, aggregating a height of more than two thousand feet above the present river. I counted twenty-two of these terraces at one point in descending from the Great

Plain to the river opposite Lake Chelan. The river here flows at a depth of 2,500 feet below the level of the Great Plain.

About Lake Chelan and in the gorges and amphitheatre-like valleys of the mountains forming the right bank of the river these terrace plateaus are seen. About the mouth of the Spokane the terraces are extremely distinct and marked; Camp Spokane is situated on one of them 400 feet above the river. Along by Lake Chelan, and in many other places, the bed of the present river is composed of bowlders extending down to an unknown depth. All these facts go to show that previous to the Champlain epoch the cañon of the Columbia was cut to its present depth, and in some places far below it; that during the downward oscillation of the Champlain epoch this cañon was filled up by débris, bowlders, &c., to a height of 2,000 feet above the present river surface; and that at this time there was a great lake in the southwestern part of the Great Plain of the Columbia. During this epoch also the Grand Coulée was occupied as a secondary channel by the Columbia, and the deeply cut cañons of Moses Coulée, Wilson Creek, Kenewaw Run, Marlin Hollow, Lake Creek. Crab Creek, &c., were occupied by large streams pouring their waters into the great Columbian Lake.

When the downward movement of the Champlain epoch came to a close, and the upward movement of the Terrace epoch commenced, then the Columbia began to cut its way down through its old elevated bed of bowlders and drift with which its previously-formed cañon was filled, and the waters began to drain away from the Columbian Lake. The Columbia Cañon being very narrow, the terraces only remained where they were protected from erosion by the jutting cliffs of rocks forming recesses. This must account for their lack of continuity.

To the west of the Cascade Mountains, in Washington Territory, there are beautiful illustrations of these post-tertiary high-latitude oscillations in the numerous inlets, passages, canals, and straits making up Puget Sound. These complicated channels are without doubt the work of glacial erosion at a period of greater elevation than the present. Subsidence filled them with water from the sea, which also spread over the land far to the south. Numerous gravelly prairies between the Columbia and Puget Sound, and the Suoqualmie, Steilaguamish, and other flats, attest the presence of a much more extended sound than now exists. A partial re-elevation has brought the sound to its present beautiful and interesting proportions.

Looking at the map of the Columbian Basin, and having a personal knowledge of the country, the question naturally arises, why did the waters choose their present courses, and how were the tremendous cañons through which they flow formed? The basaltic rock composing these cañons is extremely hard in some places; notably in the cañons of Snake River near the Salmon River it is almost as hard and compact as solid flint or obsidian. The rocks between high and low water have a

polished vitrified appearance, and it seems to me that for water to wear through this Snake River Cañon of more than 3,000 feet of extremely hard rock for 200 miles in length would take an inconceivable length of time. The same may be said of the cañon of the Upper Columbia, the cañon of the Des Chutes, of the Salmon, and the tremendous gorge where the Columbia cuts through the Cascades.

It would seem that these cañons were not commenced until after the last of the lava flows making up the aggregate thickness of the lava over the country, for these lava flows show continuity and horizontality from one side of the cañons to the other. Of course, if a channel was once formed, any subsequent flow would fill it up with lava and force the water to commence its work all over again.

Certain appearances and studies of the Coulées of the Great Plain would indicate that they are of fissure formation. Moses Coulée, with walls from two hundred to four hundred feet high, heads abruptly in the Great Plain, forming a complete and perfect cul-de-sac. This seems incompatible with its being entirely a channel of erosion.

In the Grand Coulée, the Steamboat Rock, and the formations about the middle pass of the Coulée, are indicative to me of its being a great fissure. And so of the other coulées and cañons, now either dry or containing small streams, which do not seem to have ever been of sufficient size to cut the cañons inclosing them.

I must subscribe myself to the belief that the courses of many of the most deeply encañoned rivers of this country were determined to a very great extent by their waters finding and collecting in great fissures, and that these fissures were formed during the late Tertiary or during the upward oscillation of the Glacial epoch.

CHAPTER X.

THE GREAT PLAIN OF THE COLUMBIA.

The northern portion of the interior Columbia Basin, known as the Great Plain of the Columbia, may be described as that area bounded on the west by the Cascade Mountains, on the south by the Blue Mountains, on the east by the Bitter Root and Cœur d'Alêne Mountains, and on the north by the mountains of the Moses and Colville Indian reservations, and those in the triangular area between the Columbia and Clarke's Fork. This area is about 145 by 155 miles in extent, and contains approximately 22,000 square miles, or 14,080,000 acres, an area twice the size of Maryland, and as large as Massachusetts, New Hampshire, Connecticut, and Rhode Island together. This section is also known in popular parlance as the "Bunch-Grass Country," from the fact that nearly all the plains and hills throughout its extent are covered with this most hardy and nutritious grass.

In the spring and early summer when it is green and juicy it is very sweet and palatable, and cattle eat it with avidity. During the summer it ripens, and the heat of the sun and dearth of moisture dry it up and color it a rich yellow brown; but in this condition it is even better for stock than it was in its early green state. I have been told by an old pioneer packer, who for many years packed through the country, that his animals would keep in better condition on bunch-grass alone than they would if fed on ordinary hay and grain. "Bunch-grass" has become the synonym for things good, strong, rich, and great: the bunch-grass country is the best and finest country on earth; bunch-grass cattle and horses are the sweetest, fleetest, and strongest in the world; and a bunch-grass man is the most superb being in the universe.

Over nearly the whole of this Great Plain of the Columbia there is now spread a rich and fertile soil, varying in depth from a few inches to hundreds of feet. This soil has been produced by the grinding action of the ice and drift of the Glacial epoch, by the water-wearing of the Champlain epoch, and from the disintegration of the rocks during the last and present existing Terrace epoch; by the action of summer's rain and heat, winter's frost and cold, and the chemical decomposition arising from exposure to the atmosphere.

The eastern portion of this plain has a much greater thickness of soil than the western, and this is owing undoubtedly to the greater amount of moisture in the atmosphere, and to the soil brought down by its streams from the mountains on the east and south. Soil arising from the disintegration of volcanic rocks is known to possess in a high degree the qualities and mineral constituents needed by plants. The most fertile soils of France, Italy, the Sandwich Islands, and California are of this nature, and the wondrous harvests in some localities in the *bunch-grass country* show that its soil has no superior anywhere.

Early travelers over these sections formed and recorded various opinions concerning the quality of the lands. They were influenced in their views by the season of the year in which they traveled.

To one now who travels over an uncultivated portion of the country in the spring and early summer nothing can be more promising than its appearance around him on every side. The valleys and rolling hills stretch away covered with a luxuriant growth of green and tender grass, and the varied hues of the multitudinous flowers add color and great beauty to the scene. The soil is moist, showers of rain fall frequently, and little streams and trickling springs are seen in all directions. After awhile comes a change; the showers cease, the clouds disappear, and nothing interposes between the burning rays of the sun and the parching earth. The grass loses its cool, green hue, the flowering plants become shrunken and withered, the springs and rivulets become small or extinct, and the soil dry and dusty. During this latter period of the summer and fall the traveler would form a very poor opinion of the land, and declare that it was not capable of raising the crops required by

man. He would give it credit for being a good grazing country when water could be procured, but that is as far as his recommendation would go. This is precisely the reputation that this country has had for many years. Within a short time, however, farmers have demonstrated that the high and dry hill land is better for crop-raising than the colder and more organic soil of the valleys, and experiment and demonstration have marched along together until it is proven that over nearly the whole of this Great Plain of the Columbia the cereals—wheat, barley, oats, flax, &c.—grow and return abundant harvests.

An increase of moisture seems to come with an increase of cultivation, and every acre that is planted, tended, and harvested, adds to the total agricultural acreage of the country and its capability of grain-producing. This has been abundantly proven in Nebraska and other sections east of the Rocky Mountains. After Fort Kearney was established in 1848, the government employed a skilled farmer for years to live there and try to raise vegetables for the troops and grain for the public animals. But agriculture was a complete failure owing to lack of rain. Now all about the old fort are thousands of farms on all of which abundant crops are raised. This change has been produced by the westward progress of settlements, carrying along an increased rainfall.

In some localities on the Great Plain it is still a question whether the land will produce or not, as no experiments have been made. It is a fact that it takes about three years to test the soil thoroughly in any portion of this country. The first year the crops of grain are light, as the bunch-grass is not rotted, and tends to choke out its civilized rival. The second year the same thing takes place, but to a less extent. The third year, however, the grass has been pretty well killed and the sod rotted, and the soil properly comminuted and prepared for its work, and this year's yield will generally tell its value.

It would be policy for the great railroad companies, owning immense bodies of land in the country, to make these tests in different localities, and by this means prove to the inquiring settler what quality of land it is which is offered to him. In a great many cases, undoubtedly, intending settlers are forced away by the uncertainty as to the producing power of the soil and the lack of time and means to test it.

The two great drawbacks to the rapid settlement and growth of the country are the lack of an abundant supply of water and lack of wood for fuel and lumber. In regard to it as a grazing country, it may be said that there is grass in the greatest abundance for thousands and tens of thousands of cattle and horses, which cannot be eaten off owing to the lack of water. But in this same country in all probability a sufficiency of water can be had, either from natural sources or by digging, to supply the needs of the people and animals engaged in cultivating the soil.

The volcanic rock underlying the country is, I believe, well adapted

to the storage of water falling upon it and percolating through its small fissures and interstices to the greater fissures and cracks below. In nearly every place where it has been tried, water has been procured by digging.

SAGE-BRUSH LANDS.

Sage-brush has become almost a synonym for worthlessness, and to say that a piece of land is sage-brush land condemns it at once in the minds of many people. But this is not right; for while a great deal, probably the greater portion, of the sage-brush land of the country is poor and comparatively worthless, there are large tracts covered with sage-brush which are of the finest quality. The little, short, stunted sage-brush, such as grows about the mouth of Snake River and the Central Oregon deserts, is indicative of very poor, unproductive soil. But far different is the case when the sage-brush is thick and strong, standing from four to twelve feet high, as it does in the vicinity of Honey Lake, Surprise Valley, and many other places in California and Nevada, and in portions of the Grand Coulée and Badger Mountain country. This kind of sage-brush has been found by experience to grow only in the richest soil, which, when brought under cultivation, produces the greatest harvests. When I visited Honey Lake Valley, a few years ago, the people had already adopted the expression that the bigger the sage brush the better the land.

Sage-brush is very hard to eradicate, from the fact that no matter how thick it stands fire will not run in it. Its most fatal enemy, strange to say, is grass. I have been informed by old settlers about The Dalles and other places that large areas which are now covered with bunch-grass were, when they first came into the country, covered with sage-brush. They described the method by which the bunch-grass overcomes and replaces the sage-brush, and which subsequent observation of my own induces me to believe. This is as follows: If we have two contiguous areas covered, one with bunch-grass and the other with sage-brush, the grass grows in among the brush for considerable distances, enveloping the roots and lower portions of the brush. At some time fire comes and sweeps over the grass, burning it to the ground. This fire does not injure the grass-roots, which spring up again as green and hardy as before. Not so the sage-brush; the fire has killed it, and in a short time the old stalks and roots rot away and the bunch-grass completely usurps its place; and so the struggle goes on until the whole area is covered with grass.

In order to show the extraordinary fertility of this region of the Columbia River I give below the statistics from the United States Census office of the average yield, per acre, of the cereals grown in 1879 in the State of Oregon and Territories of Washington, Idaho, and Montana, comprising those regions drained largely by the Columbia River and its tributaries. Montana is included in this region for the reason

that, while most of the Territory is drained by the Missouri, a large proportion of the cultivated land is on the headwater streams of the Columbia, in the Missoula Basin.

Cereals of the United States; average yield per crop of 1879.

States.	Barley.	Buck-wheat.	Indian corn.	Oats.	Rye.	Wheat.
Oregon	31	17	22	29	16	17
Washington	39	24	19	41	14	24
Idaho	33	.....	29	35	12	24
Montana	30	13	29	36	29	27
Average for whole region; mean for above	33	18	25	35	18	23
Average whole United States	22	14	28	25	11	13

From this it is seen that the average yield of barley per acre in this Columbia country is 50 per cent. greater than the average yield in the whole United States, including this region; the average yield of buck-wheat is 29 per cent. greater; the average yield of Indian corn is 11 per cent. less; the average yield of oats is 40 per cent. greater; of rye, is 64 per cent. greater, and the average yield of the most important cereal of all, wheat, is 77 per cent. greater than the average of the United States.

I give below the average yield of the cereals per acre of the cereal crops of 1879 for the principal agricultural States of the Union, and those whose averages are the largest.

States.	Barley.	Buck-wheat.	Indian corn.	Oats.	Rye.	Wheat.
Arkansas	12	6	19	13	7	6
California	21	22	28	27	9	16
Dakota	17	8	22	28	10	11
Illinois	22	11	36	32	16	16
Indiana	23	10	31	25	12	18
Iowa	20	10	42	34	15	10
Kansas	13	10	31	19	12	9
Kentucky	24	10	24	11	7	10
Massachusetts	25	12	34	31	10	16
Michigan	22	12	35	34	13	19
Minnesota	26	11	34	38	16	11
Missouri	19	11	36	21	12	12
Nebraska	15	11	40	26	12	9
New York	22	15	33	30	11	16
North Carolina	11	8	12	8	5	5
Ohio	30	13	34	31	13	18
Pennsylvania	19	15	33	27	9	13
Texas	13	11	12	21	8	7
Virginia	17	8	16	9	7	9
Wisconsin	25	9	34	34	14	13

The statistics regarding the production of Irish potatoes in the States and Territories where they are principally raised is given in the following table

States.	Acres.	Bushels.	Yield per acre.
Washington	6, 823	1, 035, 177	152
Oregon	11, 106	1, 359, 930	122
California	55, 471	4, 550, 565	82
Connecticut	32, 375	2, 584, 262	80
Illinois	151, 126	10, 365, 707	69
Indiana	91, 985	6, 232, 246	68
Iowa	121, 358	9. 962, 537	82
Maine	71, 416	7, 999, 625	112
Massachusetts	32, 660	3, 070, 389	94
Michigan	134, 274	10, 923, 060	81
Minnesota	51, 419	5, 184, 676	101
Nebraska	28, 347	2, 150, 873	76
New Hampshire	29, 659	3, 358, 828	113
New Jersey	41, 683	3, 563, 793	85
New York	349, 903	33, 612, 313	96
Ohio	173, 321	12, 719, 215	73
Pennsylvania	185, 429	16, 284, 819	88
Rhode Island	5, 988	606, 793	101
Vermont	38, 855	4, 438, 172	114
Wisconsin	99, 266	8, 509, 161	86
Dakota	6, 960	664, 086	95

These statistics are only given to show the great fertility of the soil in this country drained by the Columbia, its adaptability to support a large population engaged in agricultural pursuits, and the enormous crops which its immense acreage must yield as soon as a population sufficient for their cultivation is attained and means of transportation provided. This country is far away from the seat of government and is very little known, but it is bound soon to force itself on the attention of the country as one of the grandest portions of our domain, unexcelled by any in the productions of the earth, in the beauty, extent, and yield of its waters, in its mountains clothed with splendid forests and enfolding mines of the useful and precious metals, and in its climate.

In consequence of its great and sure promise our legislators should look upon it with liberal eyes and grant abundant aid to all desirable works of public improvement which may be undertaken to facilitate transportation, sure of a prompt and rich return in the increased prosperity and loyalty of the people.

From the interior water-ways, the Columbia and Snake Rivers, should be removed, as far as practicable, all the rocky fetters which prevent and hinder full and free navigation. Commerce will require it, the people will demand it, and it must be done sooner or later.

In order to particularize a little in regard to this great plain of the Columbia, let us suppose that portion north of the Snake and Clearwater to be divided into four nearly equal parts by a line drawn due south from the Big Bend of the Columbia, near Camp Spokane, to Snake River, and

a due east and west line through the southern end of Big or Colville Lake.

The northeastern portion may be designated as the *Spokane* section; the southeastern as the *Palouse* section; the northwestern as the *Crab Creek* and *Grand Coulée* section, and the southwestern as the *Moses Lake* or *Desert* section. To these must be added the section south and west of the Snake or the *Walla Walla* section; the one south of the Clearwater and east of the Snake, or the *Lewiston* and *Mount Idaho* section; and the one to the west of the Columbia, or the *Yakima* section.

THE PALOUSE SECTION.

The lands of this section are nearly all of good quality, and are being rapidly settled. The section is well watered, the main streams being the Palouse, Cow Creek, Rock Creek, Pine Creek, Union Flat Creek, Rebel Flat Creek, Potlatch Creek, and the head waters of Lahtoo or Hangman's Creek. These streams all flow through deep cañons with narrow valleys or through deep depressions bounded by rolling hills. Besides these there are numberless smaller streams.

Considerable *scab land* exists in the western and northwestern parts of this section. The land so designated by the people of the country is that where the original volcanic rock is exposed and uncovered by any soil. Patches of this exposed rock exist scattered through the most fertile regions. This is the most fertile, most thickly settled, and best known of the four sections north of the Snake. Several fine towns have been started in this country; the principal one, and the one which is destined to become quite a railroad and commercial center, is *Colfax*, at the junction of the north and south forks of the Palouse. Probably not more than one-tenth of the land in this section is taken up and occupied.

The western portion is devoid of timber, but in the eastern portion about the headwater streams of the Palouse and Hangman's Creek, plenty of fine timber exists.

One of the most singular and prominent features of this section is Steptoe Butte, a perfect cone, elevated about 2,000 feet above the surrounding country, standing quite alone, isolated from any neighboring peak or range.

Another singular feature of this section is the fact that a number of the streams run in a direction parallel with the Snake. Union Flat Creek heads about six or eight miles from the Snake River, to the northeast of Lewiston, and then takes a northwesterly course, and for seventy miles, until it flows into the Palouse, keeps at about the same distance from the river. Rebel Flat Creek, Willow Creek, and the main forks of the Palouse all follow the same general direction, making to a great extent the same bends. It is probable that glaciers moving in this general direction must be assigned as the causes of this parallelism.

The falls of the Palouse form another of the interesting objects of this section. In the lower portion of its course the Palouse flows through a deep fissure in the basaltic rock, portions of which take fantastic forms,

as towering pinnacles, &c. At the falls the river descends perpendicularly for about 120 feet into a narrow basin, from which it flows off through its deep cañon for about nine miles to the Snake River. The salmon ascend only to the falls; and the Palouse Indians have a legend which tells of the wickedness of the Indians higher up the country, and how the *Great Spirit* in his displeasure placed the falls as a barrier to the further ascent of the salmon.*

THE SPOKANE SECTION.

This section is more varied than any of the others. In its southeastern part is Cœur d'Alêne Lake and the fine timber-covered country surrounding it. In its northeastern and eastern part are the gravelly Spokane Plains and the fertile prairies embedded in the northern woods. Its western portion comprises some of the finest farming lands in the Territory, among which are those known as the Deep Creek, Four Lakes, Upper Crab Creek, Hawk Creek, and Cottonwood Spring Counties, Gordon Prairie, &c. The Spokane River runs through this section, giving water transportation for the timber from the great forests about its headwaters, and furnishing one of the finest water-powers in the world. The main line of the Northern Pacific Railroad runs diagonally through the section. Along the Spokane River, below the falls and upon its small tributaries, there is a good deal of timber, which will furnish the inhabitants and settlers with wood and lumber for a number of years, until more railroads are built and the commerce in grain, fuel, and lumber becomes established.

Due west from Spokane Falls and extending in a westerly direction is the divide, between the streams which flow north into the Spokane and south into Crab Creek. This divide is no higher in appearance than the country to the north and south; it abounds in springs and swales, where the waters collect and then flow away as rivulets and brooks through the gently-rolling hills at first, finally becoming more deeply encañoned as they near their destination at the greater river or creek. Of course those flowing north into the Spokane cut more deeply than those flowing south. This divide is of importance in the economy of the country, as it furnishes an excellent route for a railroad, which will pass through an extremely fertile and desirable country, and be easily accessible from both sides throughout its entire length. This railroad is one which in the near future must certainly be built. Its starting-point must be at the falls of the Spokane, from where it will stretch away westward to the Okinakane and vicinity of the Wenatchee, bearing in one direction its loads of grain to be ground into flour for shipment to the great world, and in the other direction the fuel, lumber, and merchandise required by the inhabitants of the country through which it passes.

Among the singular features of this country are the Spokane Plains. Lying along the banks of the Upper Spokane, and extending off towards

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* Stanley.

Pend d'Oreille Lake, there is a system of nearly level plains rising one above the other into terraces towards the north. These plains are composed chiefly of gravel and bowlders, and the vegetation on them is slight, and they are not well adapted to farming purposes. The higher terraces seem to be much better than the lower ones, as there is more good rich soil intermixed with the gravel on them.

It would be a mistake, however, to suppose that these plains are valueless. They are well adapted to grazing purposes, and throughout there are large patches and strips where the rich soil has collected in sufficient quantity and depth to give most excellent farming lands. Some of the garden farms on these fertile patches are already famous for the quality and quantity of their products.

Upon this gravel plain, just above where Hangman's Creek joins the Spokane, is situated the city of Spokane Falls, and it certainly is unexcelled in the whole world as a town site. There will never be any mud, and pavements will never be needed in this beautiful place, which is already assuming the dignity and business appearance as well as the name of a city. The Northern Pacific Railroad here crosses Hangman's Creek, and first reaches the Spokane River; several other railroads have been projected which, when built, will make the town an important railroad center. Its situation and natural advantages must make it a place of consequence, and great things are predicted of it.

The climate is truly delightful and of the most undoubted healthfulness. In the vicinity are all the elements which go to make up an attractive place of residence; beautiful scenery of varying plain and mountain, prairies, and timbered hills, lovely lakes for boating, fishing bathing, &c.; a picturesque river abounding in the finest trout; unexcelled rides and drives, and hunting of all kinds, from prairie shooting to deer, elk, and bear hunting among the summits and gorges of the mountains.

Cœur d'Alêne Lake is an extremely beautiful sheet of clear water, well stocked with the finest trout and surrounded by beautifully formed, timber-covered mountains. Its main feeders are the Cœur d'Alêne and Saint Joseph rivers, flowing from the Bitter Root Mountains. On the banks of these streams and in their vicinity there are splendid bodies of timber, which at some time must become very valuable. These rivers are not now in a good condition to run logs on, being blocked up with fallen timber, which will have to be cleared out before they can be used. Once cleared out during high water, logs can be taken down without limit or trouble. The lake lies at the same general level as the lower Spokane Plain, and is an old eroded basin formed at a period of greater elevation than the present. About eight miles down the Spokane River from the lake there is a very great contraction of the river at the Little Falls. This has had the effect of slowing up the waters between it and the mouth of the lake, and depositing a large amount of gravel, pebbles, and bowlders, thus damming back the waters into this eroded basin

and forming the lake. Little bottom land lies along the lake, and the banks are generally steep and high.

In the Four Lake country there are three small lakes, whose waters are strongly impregnated with the carbonate of soda, and which have been dubbed the Medical Lakes. The water has a very soapy feel and effect, and is delightful to bathe in. The effects of a strong and continued wind storm on the lakes is very curious; the water is lashed into a soapy foam very white and light, which collects on the banks to a depth, at times, of several feet.

THE CRAB CREEK AND GRAND COULÉE SECTIONS.

This is a portion of the country which is and has been very little known. Its remoteness has deterred settlers from going to it. Before I first went into the section, in 1879, I could obtain very little information in regard to it. Then, all the inhabitants were three or four cattle-raisers living along Crab Creek—"Portugee Joe," living on Kenewaw Run, and "Wild Goose Bill," on the headwaters of Wilson Creek.

The establishment in 1879 and abandonment in 1880 of the military post of Camp Chelan, caused many people, in the capacity of teamsters and other government employés, as well as the military, to go over the country, and a knowledge of it has been thus acquired and disseminated, and now there are quite a number of settlers who have gone into the country to make themselves homes. Of course it cannot become much of an agricultural country until a market for its products is afforded by the construction of a railroad into it. This section has never seemed to enter into the minds of people except as a broken and almost desert land, but I speak from a knowledge acquired by traveling over nearly the whole of it, and I shall not hesitate to characterize it as a very fine agricultural and grazing section. The country between Crab Creek and the Columbia is well watered by streams heading along the divide already mentioned, which lies quite near the Columbia; these streams flow with more or less water, according to the season of the year, through valleys of varying width, in a southwesterly direction, to Crab Creek. The land about the heads of these creeks and that lying between the creeks along their lower course is of the finest quality, growing the most luxuriant bunch-grass and giving every evidence of being a magnificent grain country.

In 1880 I laid out a wagon-road from Ritzville, on the Northern Pacific Railroad to Camp Chelan, a distance of one hundred and seven miles. Over nearly the whole of this distance I found the bunch-grass growing strongly and well, and the soil of undoubted fertility. The rolling hills to the south of Crab Creek for a distance of from five to twenty miles are of the same exellent quality as those to the north. Of course there is some poor land in the area east of the Grand Coulée, but as a whole it is scarcely to be surpassed.

The Grand Coulée is the most singular, prominent, and noted feature

of this portion of the country. It commences on the Columbia between the mouths of the Sans Poil and Nespilem rivers and extends in a southwesterly direction for fifty-five miles, when it merges into the bowlder-covered, prehistoric Columbian Lake mentioned in the geological chapter of this report. Except at one point it is a deep chasm, with vertical, impassable walls, averaging about 350 feet in height. About midway between its extremities these walls are broken down, entirely so on the east, and so much so on the west that a wagon has no difficulty in ascending. The coulée here is partially filled up by the broken-down hills. The cause of this break seems to have been a flood of water or ice coming in from the northeast and flowing off down through the coulée chasm. Many rounded bowlders are here found in the soil, and great rocks of large size, which could only have been transported by the agency of ice. To the north of this middle pass the bottom is quite level; it has some springs and small ponds, and can be traveled without difficulty. It is in some places nearly four miles wide. The southern portion is very narrow, and the bottom is filled with a succession of lakes, the northern ones being of clear, white, sweet water filled with fish; toward the south the lakes become more and more strongly impregnated with alkali, until the one at the end of the coulée is of the most detestable unpalatable nature. At its junction with the Columbia the coulée is crossed by a very bad wagon-road, and a trail crosses it about seven miles from the Columbia. The only other place where it can be crossed is at the Middle Pass mentioned above.

I first called attention to this Middle Pass in 1879, and located a wagon-road across it in 1880. It is the only place where, by any means, the coulée can be crossed by a railroad from the Columbia to its end near Moses Lake. The southern portion of the coulée from this point cannot be crossed or traversed owing to the lakes and steep walls.

To the west of the Grand Coulée there is another running nearly parallel with it, known as Moses or Little Coulée. This has a number of springs and much good land in it. The land between the two coulées is mostly rich and covered with bunch grass. This Moses Coulée comes to an abrupt end, inclosing a little lake.

Foster Creek, with its many branches and fertile soil, lies to the north. Many springs and little lakes exist throughout this portion of the section under discussion. There is every inducement in the way of natural advantages for thousands of settlers in this portion of the country.

West of Moses Coulée there is a condsiderable area of timber land, and the vegetation indicates a rich soil, but water is not plentiful. It may be obtained by digging, but this has not been tried, and hence is uncertain.

In the southwestern portion of this section lies Badger Mountain. This could only be called a mountain in a country as flat as the Great Plain, and does not deserve the name. It is a long, rolling divide, whose sides are cut by gullies, in many of which springs are to be found. The

soil of this mountain appears to be exceedingly rich, and, indeed, if I was asked to name the richest, most fertile area in this whole Columbia Basin, I know of none that I would name before Badger Mountain. The vegetation is indicative of its fertility, being, besides bunch-grass, rose bushes, choke-cherry bushes, haws, willows, &c., all growing thick and strong. The country is well watered, and will, in time, have an easy outlet by the Columbia River, and deserves the attention of everybody having the great transportation and other interests of the country in hand.

Throughout this section the Great Plain lies about 2,000 to 2,500 feet above the river level, and it is extremely difficult to get from one to the other. West of the Grand Coulée, the only practicable railroad route to the Columbia, that I am sure of, is by way of Foster Creek.

By this route an excellent grade can be made to the river. It is possible that by the way of Moses Coulée, or the southern side of Badger Mountain, an easy way to the river may be discovered.

The commercial center of this section will probably be somewhere in the vicinity of the Middle Pass of the Grand Coulée. Another and greater center will, in the future, be located near the mouth of the Okinakane.

THE MOSES LAKE OR DESERT SECTION.

This last one of the four sections which I have been considering, can be dismissed with a few words, and those almost entirely of condemnation. It is a desert, pure and simple, an almost waterless, lifeless desert. A few cattle exist along the Columbia, where they can reach the river for water, and some more along the lower Crab Creek below Moses Lake. This section is much lower than the remainder of the Great Plain, and evidently was a lake for hundreds of years, forming deposits several hundred feet in thickness, and which are plainly shown at the White Bluffs and Crab Creek Coulée.

A large portion is covered with bowlders embedded in a loose, light, ashy soil; other portions are covered with drifting sands, and, taken all in all, it is a desolation where even the most hopeful can find nothing in its future prospects to cheer.

Crab Creek sinks soon after receiving the waters of Wilson Creek, and rises just above Moses Lake, of which it is the only feeder. At this point the water is passably good to drink. Moses Lake is stagnant, alkaline, and unfit for any use. At its lower end are great sand dunes and sandy wastes.

The water seeps through this sand and rises again a few miles to the south and flows southwesterly to Saddle Mountain, where it is turned to the west, sinking and rising several times. I do not think that it now ever reaches the Columbia. Below Moses Lake the creek water is alkaline, filled with organic matter, and unpalatable.

The following account of a journey across the two western sections of the Great Plain is from my report to the Chief of Engineers in 1880:

In August, 1879, I left Walla Walla and proceeded to Wallula, and thence up the Columbia to the White Bluffs. At the head of the long island, we left the river to look out for a practicable route for a wagon-road to the military camp, then in the vicinity of the mouth of the Okinakane, on the supposition that it was to be permanently located there.

We reached the top of the bluffs, which are here about 540 feet high, by going up through a long gulch greatly beaten by cattle. The soil is dry and is ground to powder by the feet of the cattle wherever they make a path, and is not well suited for a road. We however found, a short distance down the river, a gulch, up which the ascent to the top of the bluffs is easy and gradual.

From the summit the country spreads out, gently rolling, as far as the eye could reach, to the northeast and east. To the north and northwest a small mountain chain, devoid of timber, stretched itself from east to west across our way. It is called Saddle Mountain. The country was covered with a luxuriant growth of bunch-grass, with here and there a tract of sage-brush. The soil is of firm and excellent quality. Quite a large number of cattle were seen, all of which had to descend to the river for water.

Proceeding somewhat to the northeast, to skirt Saddle Mountain, we soon found ourselves getting into a country more sandy and more rolling, and our mules and horses had greater difficulty in getting along. In the afternoon, being on the lookout for water, we made for a green-looking spot off to the east, hoping it was a spring. In this we were disappointed, and we continued on our way until nine o'clock at night, when, not finding any water, we unloaded and made ourselves as comfortable as possible without it. The next morning before daylight we took up our laborsome march through the sands of the desert and traveled until about two in the afternoon, when, as our animals were suffering intensely from thirst, and as we were uncertain about what lay before us directly north, we concluded to strike to the westward, as from all the indications it was more likely to give us a supply of water. About three o'clock we came to an old road, which gave indications of having at one time been well traveled, and we turned and followed it to the northward, trusting that it would take us to water.

At five o'clock our animals seemed utterly unable to carry their packs any further, and so we unloaded them and piled up our baggage and kept on without it. About nine o'clock that night we came to a small alkali pond, which, vile as it was, seemed like nectar to us and to our poor horses and mules.

The country we had traveled was covered partly with sage-brush, bunch-grass, and weeds, and was utterly waterless and lifeless. Not even the cheerful coyote lived there, for not one lulled us to sleep or molested our abandoned provisions and camp equipage. The next day we found the fine spring which feeds the alkali pond above mentioned. I afterwards learned that it goes by the name of Black Rock Spring. Here the face of the country changes to a certain extent and becomes more broken up.

Black Rock Spring is at the head of a coulée which extends off to the southwest, and probably as far as Moses Lake. From Black Rock Spring we kept to the north, and in about nine miles came to Crab Creek, which is here quite a stream, flowing through a rich bottom half a mile wide. Up the stream the bottom narrows and becomes a chasm, formed by the perpendicular and overhanging walls of basaltic rock. Lower down the bottom became a marsh, entirely filling the space between the basaltic walls, in which the creek sinks to collect again further below. Where we crossed it the bottom was good, and the descent and ascent from the great table land were comparatively easy. A goodly number of fine fat cattle inhabited this valley and the adjoining high grounds, and no doubt fine gardens could be made and nearly every garden vegetable raised.

Leaving Crab Creek we went nearly northward, taking as a guide the Pilot Rock, a mass of rock about thirty feet high, but which, on account of the general flatness of

the country, can be seen for a great distance in every direction. Soon we crossed Kenewaw Run, the dry bed of a winter stream, now containing a scanty supply of water in lakes and springs. Leaving this we crossed shortly afterwards Wilson Creek, a fine little stream flowing through a rich bottom. It and Kenewaw Run are deeply imbedded below the general surface of the Great Plain of the Columbia, have fine soil and abundant grazing in the bottom and the adjacent hills and upper plains for great numbers of cattle or horses. The scarcity of timber of any kind for fuel and building purposes is, and must always be, a great drawback to the settlement of this section. Keeping on over the part of the Great Plain lying between Wilson Creek and the Grand Coulée, a rich rolling country covered with a luxuriant growth of bunch-grass, we descended by mistake into the Cold Spring Coulée, down which runs the great trail of the Indians from the Spokane country to the Wenatchee and Moses Lake countries. We climbed out of this coulée, and, passing over the broken and rocky summit between the two coulées, we descended by a long gradual slope of about three miles into the Grand Coulée. The Pilot Rock was right above us, on the west ern bank, to the north. Here in this vicinity is the best place to cross the coulée for a road going east and west. The bottom of the coulée is uneven and more than a thousand feet above the present level of the river. The sides show no water-marks. We went north through the coulée, its perpendicular walls forming a vista like some grand old ruined, roofless hall, down which we traveled hour after hour. The walls are about 300 to 400 feet high. At about seven miles from the river a trail crosses the coulée, and we turned here and went to the west until we struck Foster Creek, down which we kept, following the wagon-road made by the troops which preceded us, to the winter camp, and which crosses the coulée at its junction with the Columbia River.

Some good ranching land lies along Foster Creek, and all over the northern portion of the Great Plain bunch-grass grows in the greatest luxuriance. There are numerous little ponds, which, fed by springs, keep a supply of water all the year, and also numerous springs of excellent water.

Pursuant to instructions from General Howard, Lieutenant-Colonel Merriam and I began a search for the most suitable location for the new post. We examined both sides of the river from the mouth of the Okinakane to Lake Chelan, and decided that the most advantageous sight, taking everything into consideration, was at the outlet of Lake Chelan, the plateau on the north side of the lake and river. An unlimited supply of timber and pure water is at hand and available for every purpose. Lake Chelan is a wonderfully beautiful sheet of water, about sixty miles long, according to the Indians, and from one to five miles wide. It seems to be, and is in fact, a dammed-up mountain cañon of the most rugged and pronounced description. The water is of diamond-like clearness, and yet in places no sight can penetrate to the bottom of its liquid depths. It is supplied from mountain springs and from the melting snows of the mass of snow-capped mountains lying about it.

In a dug-out canoe paddled by old In-na-ma-setch-a, the chief of the Chelans, and his two sons, Colonel Merriam and I went up the lake about twenty-four miles, and found it to increase in rugged grandeur and beauty at every paddle-stroke. Walls of granite rose in places almost vertically for a thousand feet above the waters and down below them farther than the eye could reach. Elsewhere the steep mountain walls were covered with fine pine and fir and dense undergrowth. Game was abundant, as evidenced by the game-trails and the reports of the Indians. At one of our landings Colonel Merriam killed a black bear and saw two others. We were sorry not to be able to go any farther up the lake. It is the most grandly beautiful body of water that I have ever seen. Lying about two hundred and fifty feet above the Columbia, it discharges its waters through a gorge, a cleft-like channel a mile and a half long and only a few feet in width.

After deciding upon the location of the post, I left the temporary camp to go to the

Spokane Falls and Fort Cœur d'Alêne. The country traversed was nearly all rolling bunch-grass land of the richest description, and the most of which will, I believe, be available for raising grain.

WALLA WALLA SECTION.

The Walla Walla section, bounded on the north by the Snake and Columbia Rivers and on the south by the Blue Mountains, is too well known for any description here to be necessary.

YAKIMA SECTION.

The Yakima section is sufficiently described in another portion of this report.

LEWISTON AND MOUNT IDAHO SECTION.

The Lewiston and Mount Idaho section alone remains to be noticed. This is bounded on the north and east by the Clearwater, on the west by the Snake, and on the south by the Salmon River, and although it can scarcely be considered a part of the Great Plain of the Columbia, it is intimately connected therewith.

Denudation has done a wonderful work here. One standing on the highlands to the north of the Clearwater and looking to the south sees Craig's Mountains as a level plain, covered with timber. This plateau of Craig's Mountains has an elevation of 4,300 feet above the sea and 3,000 feet and more above its encircling rivers. The rivers have cut through this elevated plateau, and the local waters have washed it down into gradual slopes toward them. Standing on the eastern edge of this plateau and looking to the east, one can contemplate the almost incredible work that has been done in sculpturing the country to its present form; he can readily see that the plateau on which he stands is a fragment of an immensely greater plateau which at one time extended unbrokenly away to the east, to the distant summit chains of the Bitter Root Mountains, and that the great cañons of the rivers surrounding him, and those seen in the distance, in which flow the many branches of the Clearwater and Salmon, have all been excavated from the plateau on which he stands. Any conceivable time will appear to him too short for the work before him.

Upon the plateau of Craig's Mountain the frosts are too severe to allow of agriculture, but in all the low country about it the soil is of extreme richness. A large portion of the section is taken up by the Lapwai or Nez Percé Indian Reservation. To the southeast of Craig's Mountain lies Camas Prairie, a very fertile region, in which are situated the towns of Grangeville and Mount Idaho.

The only outlet of this Camas Prairie country is by the wagon-road over Craig's Mountain, which is excellent in the summer and autumn, but almost impassable during the winter and spring.

CHAPTER XI.

THE GEOGRAPHICAL NOMENCLATURE OF THE COLUMBIA RIVER REGION.

The subject of the geographical names of a country, their origins, meanings, modifications, changes, loss, and final adoption is one of absorbing interest, especially to the student who wishes to trace the history of his country from its earliest settlement to its full development.

The geographical names in this country of the Columbia are derived from the following sources:

1. Indian names.
2. Names given by the early navigators of Spain, England, and the United States.
3. Names given by the early explorers, as Lewis and Clarke, Bonneville, Fremont, and others.
4. Names given by the early fur traders.
5. Names given by the final and permanent settlers.

In regard to the first of these sources, it is of course highly desirable to retain, as far as possible, the names of places as given by the Indians. This is, however, often rendered extremely difficult, from the fact that the same thing may receive different names from different tribes, or even from the same tribe, and that Indian names often are simply generic, applying to all or many things of the same sort. As example may be cited the different names given to the Willamette by the different tribes living along it; the Snake, also, where it flowed through the Palouse Indian country was called by them the Palouse; where it flowed through the Nez Percé country it was called the Nez Percé, and through the Snake country the Snake.* Indian names are often of such extreme length that people cannot be induced to retain them. Thus the Ne-hoi-al-pit-qua River has become changed, by common consent, into Kettle River, and is so called even by the Indians themselves. The settlers of a country rarely have sufficient regard for their savage neighbors to wish to retain their nomenclature, and the consequence is it is soon completely replaced by one, as a general thing, very unpoetical and commonplace.

The Spaniards have left few names to commemorate their explorations along the coasts of Oregon and Washington. The names given by them, generally in honor of some saint or in commemoration of some church festival, have been replaced by others given by the English and American navigators who succeeded them.

Many of the names given by the early explorers still remain and will continue so to do. Where they are not Indian names they were generally given in honor of some public functionary, or some of their own men, or descriptive of some peculiarity or occurrence.

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*Mullan.

The names given by the early fur traders are chiefly French, as the *voyageurs* were mostly French Canadians, and are, as a general thing, descriptive, as for instance, the *Des Chutes* River or *La rivière aux Chutes*, the river with falls; "*Les Dalles des Morts*," the Rapids of the Dead or Death Rapids, &c. These names have in many instances been changed into their English synonyms, as the *Chaudière* has become *Kettle Falls.*

The names which are finally adopted and live, belong to all the preceding classes and to the last class, or those given by the permanent settlers. The great majority of these latter names refer to some characteristic, and as many places have the same characteristics it results that there are a great number of Willow, Rock, Trout, Mill, Salmon, and Cottonwood Creeks, &c. This multiplication of objects bearing the same name is a great inconvenience at times. Many names are given in remembrance of localities in distant States and foreign lands, as Portland, Albany, Damascus, &c., or in honor of some distinguished citizen of the world, as Colfax, Astoria, Mount Jefferson, Abert Lake, Vancouver, &c. Many are given in honor of the first or some prominent settler in the locality, as for instance Wilson Creek, Prineville, Powell's Valley, Applegate Creek, Ritzville, &c.

Some names show in a high degree the poetical and religious aspirations of those giving them, as for instance Aurora, Zion, Sweet Home, Sublimity, Buttercup, Glad Tidings, Corvallis, &c.

In the works relating to the Columbia region I have found a great diversity in the manner of spelling certain names as well as in the names themselves, and as there have been articles written about some of these names, and the proper mode of spelling them discussed, I give in the following pages such information in regard to them as I have been able to gather.

The proper and complete study of the geographical names of this region would take vastly more time and labor than I have been able to devote to it. It is to be hoped that some one may take up the subject and carry it to completion.

CŒUR D'ALÊNE.

This name, which literally translated means "*heart of awl*," was applied to the Indians living about the lake which now bears this name, by the French *voyageurs* and partners of the Hudson Bay Company. These Indians used to come to Spokane House with the furs which they had gathered to trade. They brought them of such fine quality and in such quantity that the Hudson Bay Company deemed it desirable to establish a branch post among them, and made them a proposition to that effect. To it the Indians replied "No; that their country was so beautiful that when the white men saw it they would want it for themselves; that they were willing to come to Spokane House and trade, but that they did not want the white men to come into their country."

They were, moreover, very sharp and cute at bargaining, and were considered the "*Yankees*" of the Indian race. The whites gave them the name of Cœur d'Alênes, "Awl-hearts," "Sharp-hearts," or "Pointed-hearts," as indicative of their characters as sharpers and cheats at bargaining, and on account of their persistent refusal to allow the white men to come among them. This origin of the name was given me by Father Eells, of the Chemakane Mission. It is about the same as that given by Lieutenant Mullan. Cœur d'Alêne Lake was called by its Indian name of Sketch-hugh Lake, by Alexander Ross.

A. N. Armstrong, a writer on Oregon and Washington Territory, in a book written in 1856, gives the following explanation concerning the appellation Cœur d'Alêne, as applied to the "*Skitsuish* or Cœur d'Alêne Indians":

> Amongst the first traders that visited this tribe was a Canadian of a close, niggardly disposition. The natives were not long in discovering this, and made in their own language a derisive remark respecting him, to the effect that "the white man had the heart of an awl," meaning that he had a contracted, illiberal disposition; the term "awl" being used by them as we sometimes use the word "pin," to denote a very trifling object. The interpreter rendered the sentence "Cœur d'Alêne," greatly to the amusement of the trader's companions, and from that day to this the tribe has been known as the Cœur d'Alêne Indians.

I am inclined to give the latter explanation credence over the former, as it seems to me more reasonable, and from the fact that the early traders did go among these Indians and trade with them, and a mission was established on their lands, to which they did not seriously object.

Ross Cox, one of the first party of the Astorian fur traders to go into their vicinity, and whose book, published in 1832, gives about the first account of the country ever published, says:

> The Pointed Hearts, or, as the Canadians call them, les Cœurs d'Alênes (Hearts of Awls), are a small tribe inhabiting the shores of a lake about 50 miles to the eastward of Spokane House. Their country is tolerably well stocked with beaver, deer, wild fowl, &c., and its vegetable productions are similar to those of Spokane. Some of the tribe occasionally visited our fort at the latter place with furs to barter, and we made a few excursions to their lands. We found them uniformly honest in their traffic, but they did not evince the same warmth of friendship for us as the Spokanes, and expressed no desire for the establishment of a trading post among them. They are in many respects more savage than their neighbors, and I have seen some of them often eat deer and other meat raw. They are also more unfeeling husbands, and frequently beat their wives in a cruel manner.

PALOUSE.

This word seems to be a corruption of the French word *pelouse*—greensward, lawn, &c. It is very descriptive of the country to which it is applied, which is a rolling bunch-grass covered section. It is written "Pelouse" by many old writers. Notwithstanding these facts there is a strong probability that the word from which it is derived is an Indian word. Lewis and Clarke call the Indians inhabiting the country to the north of Snake River in the lower part of its course the Selloat—

pallahs. Pallahs and Palouse are very similar in sound. Alexander Ross, when about to start on a trip after furs, in naming over the Indians with him speaks of a *Palooche*, which is also similar to Palouse. Ross also speaks of the Indians living along Snake River as the Pallet-to-*Pallas*, the Shaw-ha-ap-tens, and the *Paw-luch*, &c. Pallas and Paw-luch both are very similar in sound to Palouse.

The history of the word would then seem to be that it is an original Indian word similar in sound to the French word *pelouse*, which, on account of the early inhabitants being largely French, came to be considered as the original word, and that this, in the course of events, was changed to the spelling now generally adopted, Palouse.

The names by which the Palouse River has been known, as given by different writers whose works I have consulted, are as follows:

Acqua-aye-seep. Indian name. Mullan.
Drewyer's River. Lewis and Clarke.
Pavilion River. A. Ross.
Pavion River. Irving.
Pelouse River. Paul Kane.
Paluce or Pavilion River. Paul Kane.
Palouse and Paloose. Mullan.
Pelouse. Steptoe.
Pelouse. Wright.
Pelouse. Pacific Railroad Reports.
Peluse. Pacific Railroad Reports.
Pavilion River. Rev. S. Parker.
Paloose. Armstrong.

SPOKANE.

Whether to put the final *e* on this word has been a much-discussed question, and has divided the people of the Spokane region into two parties. A majority, however, seem to desire the *e*, and so it will finally be adopted, in all probability, and go down to futurity. There seems to be about as much authority for spelling it one way as another. The only clew that I have been able to obtain to the meaning of the word is in the book of Ross Cox, where he speaks of the chief of the Indians of the region as *Illim-Spokanée*, which means the "Son of the Sun." From this, and from the nature of the country in which they lived, it is fair to infer that their tribal name meant something like *Children of the Sun*. They lived principally on the great sunny plains of the Spokane, while many of the neighboring tribes lived in the woody, mountainous regions of Cœur d'Alêne, Pend d'Oreille, Kootenay, and Colville rivers.

I have been told by men long resident in the country that the original word was pronounced with a slight vowel syllable *e* at the end—*Spo-kan-e*. This vowel syllable, indistinct at best, was soon dropped by the busy whites, who love not long names.

In an official Congressional report submitted January 19, 1822, and in one submitted May 15, 1826, the post at Spokane is called Lantou

and Lanton. This is probably the same word as Lah-too, mentioned by Mullan as the Indian name of Hangman's Creek.

In speaking of the Astorian trading establishments these reports say: "One of these subordinate establishments appears to have been at the mouth of Lewis River (Fort Nez Percé or Walla Walla, where Wallula now stands); one at Lantou (Spokane House, near the junction of the Spokane and Little Spokane rivers); a third on the Columbia, 600 miles from the ocean, at the confluence of the Wantana River (Fort Okinakane); a fourth on the East Fork of Lewis River (I believe this was on the Clearwater at the mouth of Lapwai Creek, where the Indian agency now is, but I am not certain); and the fifth on the Multnoma (Willamette)."

The following are the methods of spelling the word Spokane, as adopted by different writers:

Spokan ....Official transfer papers, Pacific Fur Company to Northwest Fur Company.
Spokan .....Ross Cox.
Spokane .....War Department map, 1838.
Spokane ..... Commodore Wilkes.
Spokein .....Rev. S. Parker. This writer, who visited the country in 1836, says: "The name of this nat on is generally written Spokan, sometimes Spokane. I called them Spokans, but they corrected my pronunciation and said *Spokein*, and this they repeated several times, until I was convinced that to give their name a correct pronunciation it should be written Spokein."
Spokan ....Greenhow.
Spokain.....McVickar.
Spokan .....Nath. J. Wyeth's report, 1839.
Spokane .....Robertson.
Spokane .....Thornton.
Spokane .....A. Ross.
Spokan .....Franchere.
Spokan .....Irving.
Spokan .....National Railroad Memoir.
Spokan .....Armstrong.
Spokan ....St. John.
Spokane .....Pacific Railroad Reports.
Spokane .... .Mullan.
Spoken .....Robertson and Crawford.

OKINAKANE.

I have never been able to determine the meaning of this word. It has been spelled in a great variety of ways, and it is difficult to adopt a spelling which will be satisfactory to all. The above is the spelling as adopted in the Pacific Railroad Survey Reports and the Northern Boundary Survey Reports.

The Okinakane is called the Wantana River in Congressional reports of 1822 and 1826, referring to a military establishment at the mouth of the Columbia.

The following show the modes of spelling the word by different authors:

Otchenaukane	Lewis and Clarke.
Okunaakan	Official transfer papers, Pacific Fur Company to Northwest Fur Company.
Oakinagan	Ross Cox.
Okenakan	Franchere.
Okanagan	War Department map, 1838.
Okanagan	Cushing's Report.
Oknagan	Nathaniel Wyeth.
Oknagen	Nathaniel Wyeth.
Oakenagen	H. J. Kelly.
Okonagan	Commodore Wilkes.
Okanagan	Rev. S. Parker.
Okinagan	Greenhow.
Okanagan	Robertson.
Okonagan	Thornton.
Oakanagan	A. Ross.
Oakanazan	A. Ross.
Oakinacken	A. Ross.
	Ross says Indian name for Okinakane Lake is Sawth-le-lum-tak-ut.
Okinikaine	Warner.
Oakinagan	Irving.
Okanagan	National Railroad Memoir.
Okanegan	National Railroad Memoir.
Okinakane	Pacific Railroad Reports.
Okanagan	Paul Kane.
Okinakane	Northern Boundary Report.
Okinakane	Mullan.
Okinagan	McVickar.
Oknanagans	Robertson and Crawford.
Okonagan	R. M. Martin.
Okanagan	Armstrong.

NEZ PERCÉ,

As applied to the Indian tribe, is a misnomer. Lewis and Clarke record their arrival among the Cho-pun-nish or Pierced Nose Indians, *as they call themselves*. No writer has ever accused them of piercing their noses, and it is certain that they never did so except in very isolated cases, if at all. They have been described by a number of early explorers, but this custom has never been mentioned. It is certain that they do not do so now.

FLAT-HEAD,

As applied to the tribe of Indians inhabiting the country about the headwaters of the Columbia and Missouri, is a misnomer. These Indians never were guilty of the deforming habit of flattening the heads of their children. Many writers have described them and none have mentioned the custom, although it has been repeatedly described as being practiced by the Lower Columbia Indians. Their Indian name,

as they call themselves, is *Selish*, according to most writers, the meaning of which I do not know.

The Rev. S. Parker, who traveled among them in 1835, says:

I was disappointed in seeing nothing peculiar in the Flathead Indians to give them their name. Who gave it to them, or for what reason, is not known. The name given them by the Nez Percés, which is *Sailep* does not signify flathead.

COLUMBIA RIVER.

The *Columbia River* was first called the Oregon, from the mention of the name by Carver.

In 1575 it was called *Assumption Inlet*, by Heceta. In the charts of his voyage, soon after published, it was called *Enseñada de Heceta*, and *Rio de San Roque.*

In 1789 it was called Deception Bay, by Meares.

In 1792 Gray called it the *Columbia.* Captain Clarke says that in 1805 the Indians called it the *Shocatilcum*, and another tribe called it *Chockalilum*, both being the same name, differently pronounced, in all probability. This Indian name very probably signifies *Water-friend*, or *Friendly-water.* In the Chinook language *Chuck* signifies water, and *tillicum* friend; hence the name *Chuck-tillicum*, or *Shocatilcum.*

SNAKE RIVER.

The *Snake River* was called Lewis River by Captains Lewis and Clarke. Its Indian name was Saptin, or Sahaptin, Shoshone, Palouse, Nez Percé, or Cho-punnish River, the name varying with the different Indian tribes inhabiting its bordering country.

YAKIMA.

Yakima has been spelled a variety of ways:

Eyakema	Lewis and Clarke's report.
E-yack-im-ah	A. Ross.
Ekama	National Railroad memoir.
Yackaman	Ross Cox.
Yakima	Pacific Railroad Reports.
	Lewis and Clarke's *map.*
Tapatele	Rector and Roberdeau's map.
Tapetelle	Finley's map.
Eyakema	War Department map, 1838.
Eyakema	Robertson.
Yakima	Commodore Wilkes.
Eyakama	Paul Kane.
Yakima	Thornton.

DES CHUTES.

Des Chutes River, called *La Rivière aux Chutes* by Frémont and the early French *voyageurs*, often called Falls River by the early settlers, and finally changed to Des Chutes River. Its Indian name was—

To-wah-na-hiooks	According to Lewis and Clarke.
To-war-nah-cooks	According to Finley's map.
To-war-na-he-cooks	According to Rector and Roberdean.
Low-hum	According to Alexander Ross.

UMATILLA.

Umatilla has been spelled as follows:

Umatallow	War Department map, 1838.
You-ma-talla	Alexander Ross.
Umatallow	Alexander Ross.
Umatalla	Irving.
Eu-o-tal-la	Irving.
Your-ma-talla	Rector and Roberdeau's map.
Umatilah	Frémont.
Umatilla	National Railroad Memoir.
Umatillah	Mullan.
Umatilla	Mullan.
Umatella	Rev. S. Parker.

HANGMAN'S CREEK.

This beautiful creek took its detestable appellation from the fact that on its banks in 1858 Colonel Wright caused to be hung the Indians captured by him who had been guilty of murder and other crimes.

Its Indian names given by Mullan were Nedlewhauld, Nedwhauld, Lahtoo, or Camas-prarie Creek.

It would be highly commendable to the people of the section if they would change the name from Hangman's to Lah-too or Nedlewhauld Creek.

ROCK CREEK.

In Eastern Washington Territory Mullan says this was known to the Palouse Indians as the Wah-rum, and to the Spokanes as the Oray-tay-ous, and the upper part of it as the Sil-seip-o-vet-sen, or Sil-say-poo-west-tsin.

UNION FLAT CREEK.

Indian name, Smokle Creek. Mullan.

PINE CREEK.

Indian name, Ingossomen Creek. Mullan.

STEPTOE BUTTE.

Named for Colonel Steptoe, who was defeated on the Butte by the Spokane and other Indians, called Pyramid Butte in the Pacific Railroad Reports.

Its Spokane and Cœur d'Alêne Indian name was Se-emp-tee-ta, and its Palouse and Nez Percé name was E-o-mosh-toss. Mullan.

WENATCHEE.

Called—

Wah-na-a-cha, by Lewis and Clarke.

Pisscows, by Alexander Ross.

Pisquouse or Wenatshapam: Pacific Railroad Reports.
Piscous: War Department map, 1838.
Pischous: Commodore Wilkes.
Wainape: Called by some of the Indians, according to Commodore Wilkes. None of the early writers called it the Wenatchee.

METHOW.

Called—
Meathow and Buttle-mule-emauch or Salmon Fall River, by A. Ross.
Barrier River: Commodore Wilkes.

LAWYER'S CAÑON AND CREEK.

Named for Lawyer, a head chief of the Nez Percés.

TACOMA.

Tacoma is the Indian name for Mount Ranier, and signifies the *Nourishing breast.* This name was given it probably both on account of its shape and from the fact that it is a great center from which rivers flow in every direction, nourishing the land and supplying fish. This is the name of the highest and grandest mountain in Washington Territory, and it is the hope of many people that when a State is formed of the Territory it may receive the name of TACOMA.

MAP OF THE UPPER COLUMBIA RIVER,

FROM THE INTERNATIONAL BOUNDARY LINE TO SNAKE RIVER,

ON A SCALE OF ONE INCH TO TWO MILES.

25 SHEETS AND AN INDEX SHEET.

FROM SURVEYS AND EXAMINATIONS MADE IN 1881,

BY

LIEUT. THOMAS W. SYMONS, CORPS OF ENGINEERS,
Chief Engineer, Department of the Columbia,

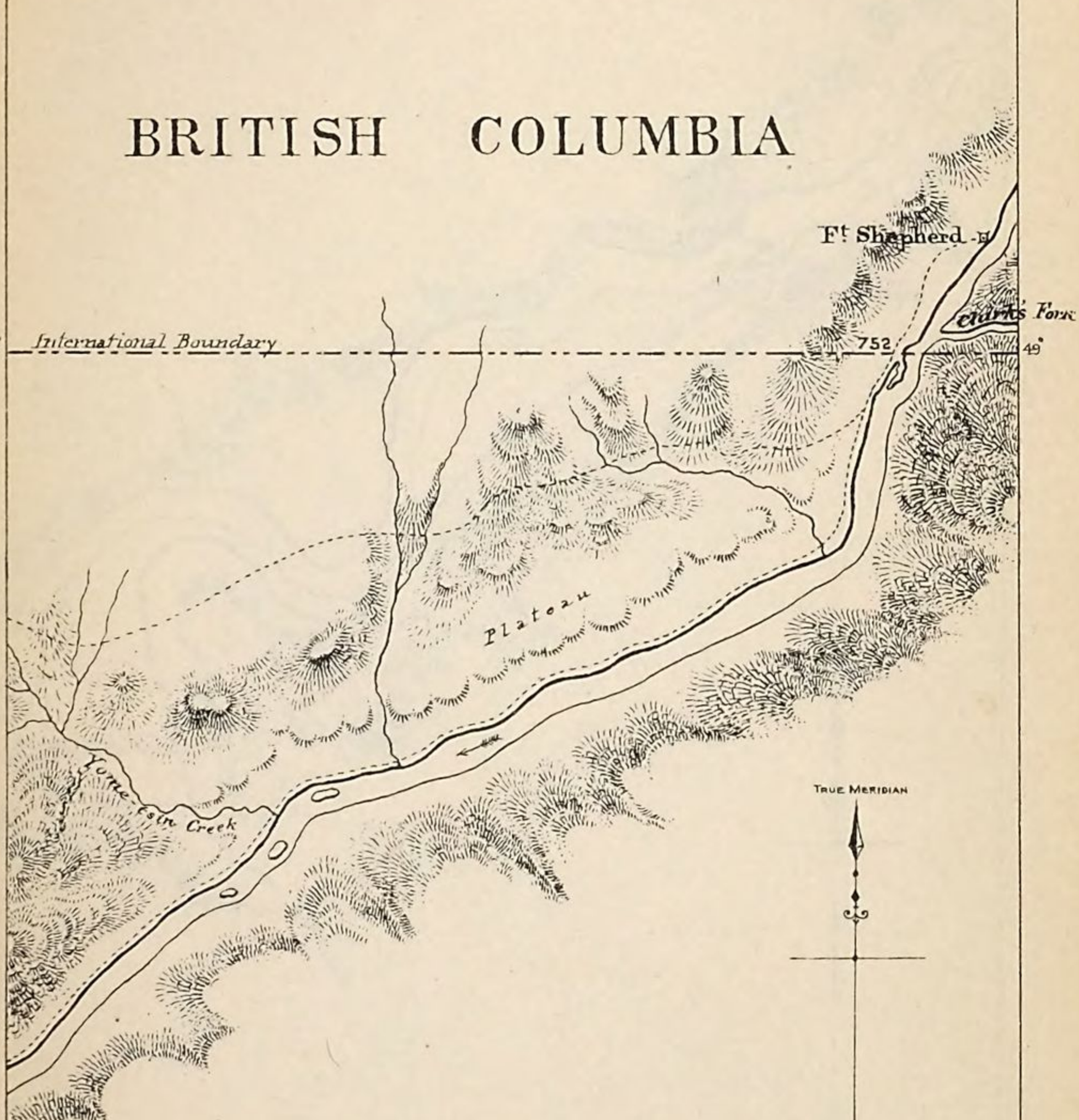
AND

ALFRED DOWNING,
Topographical Assistant, U. S. Army.

Drawn by ALFRED DOWNING.

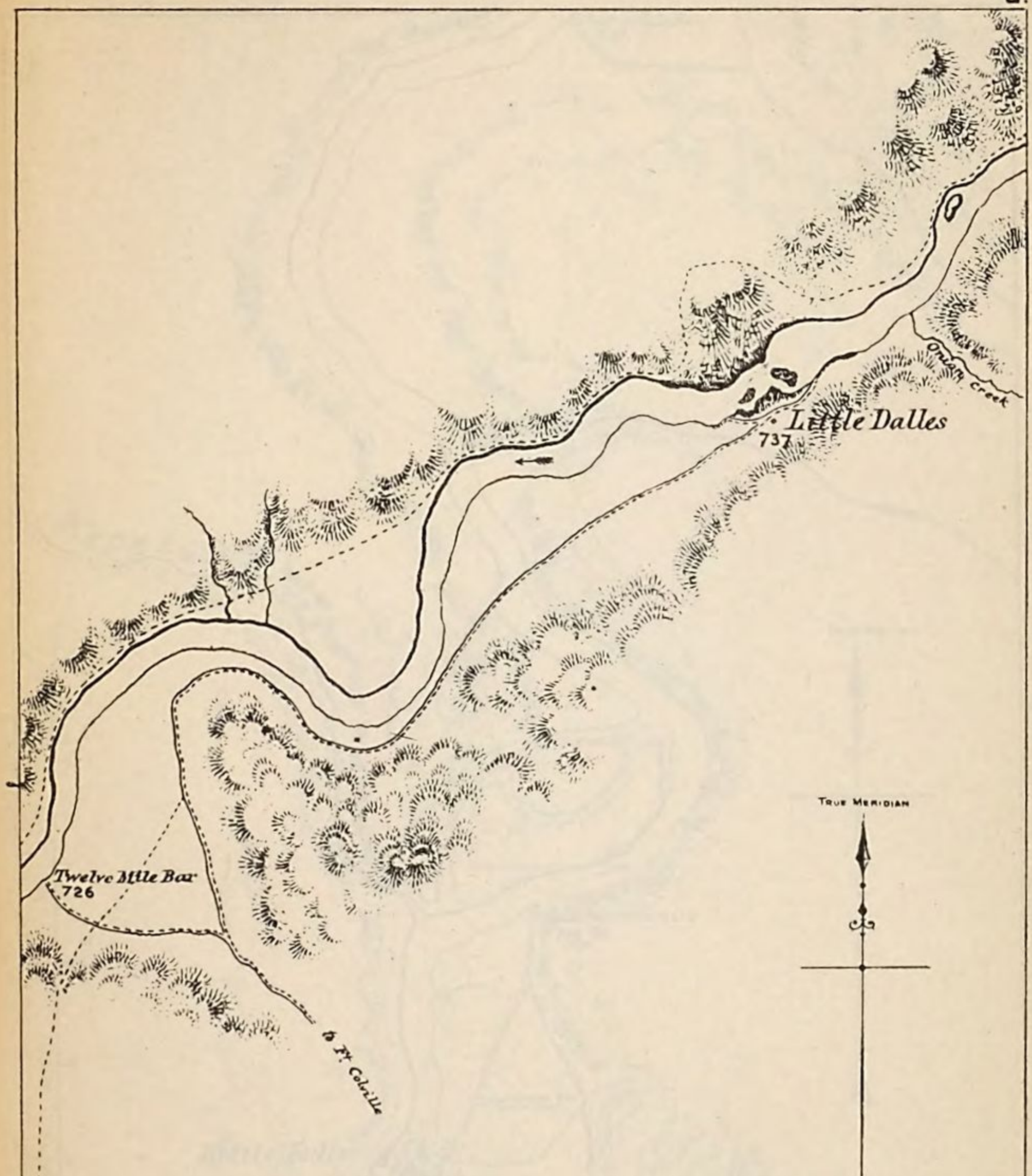
These sheets are numbered consecutively from the boundary to Snake River, and can be joined together into one sheet if desired, showing the river continuously.

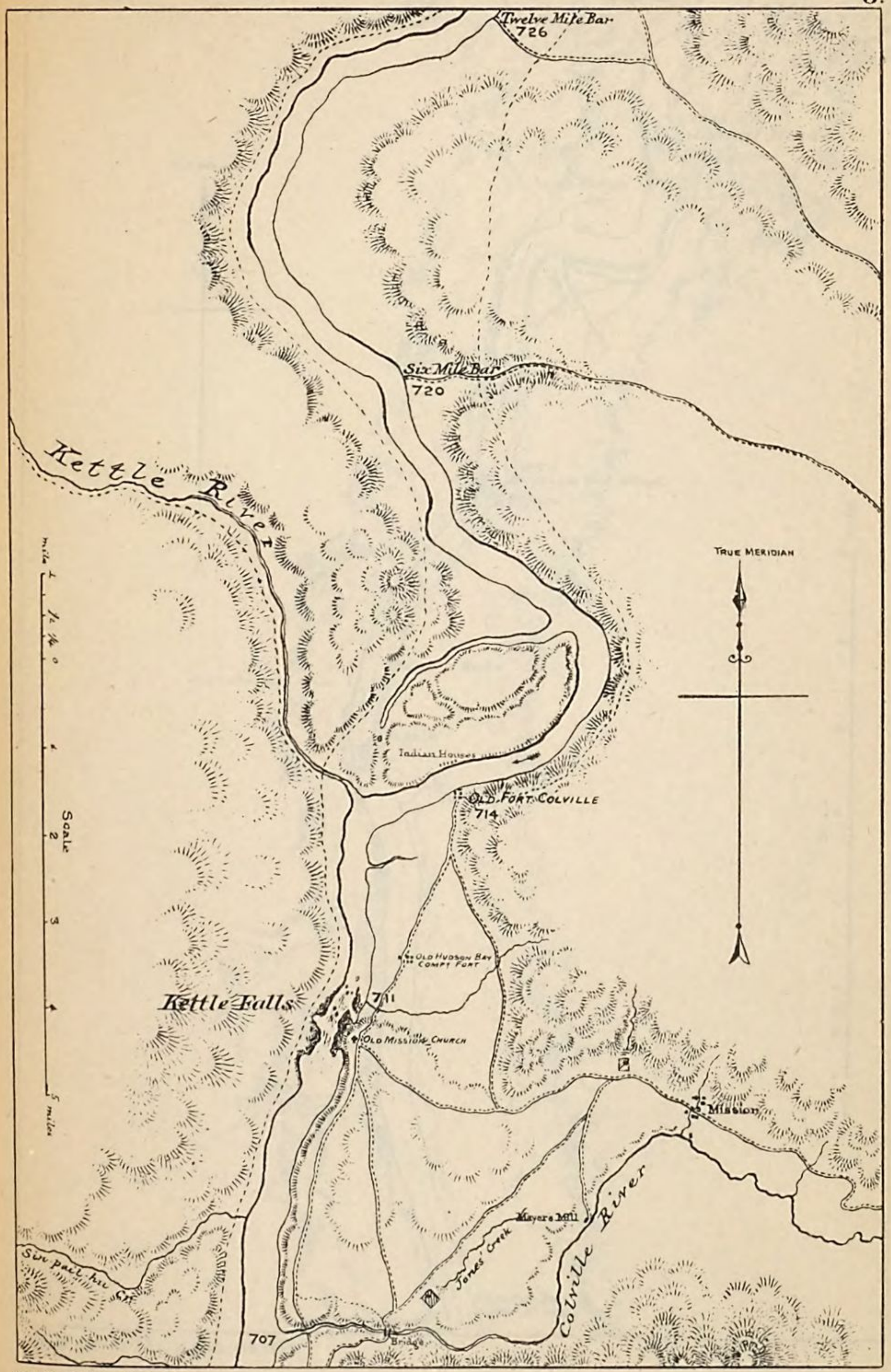
BRITISH COLUMBIA

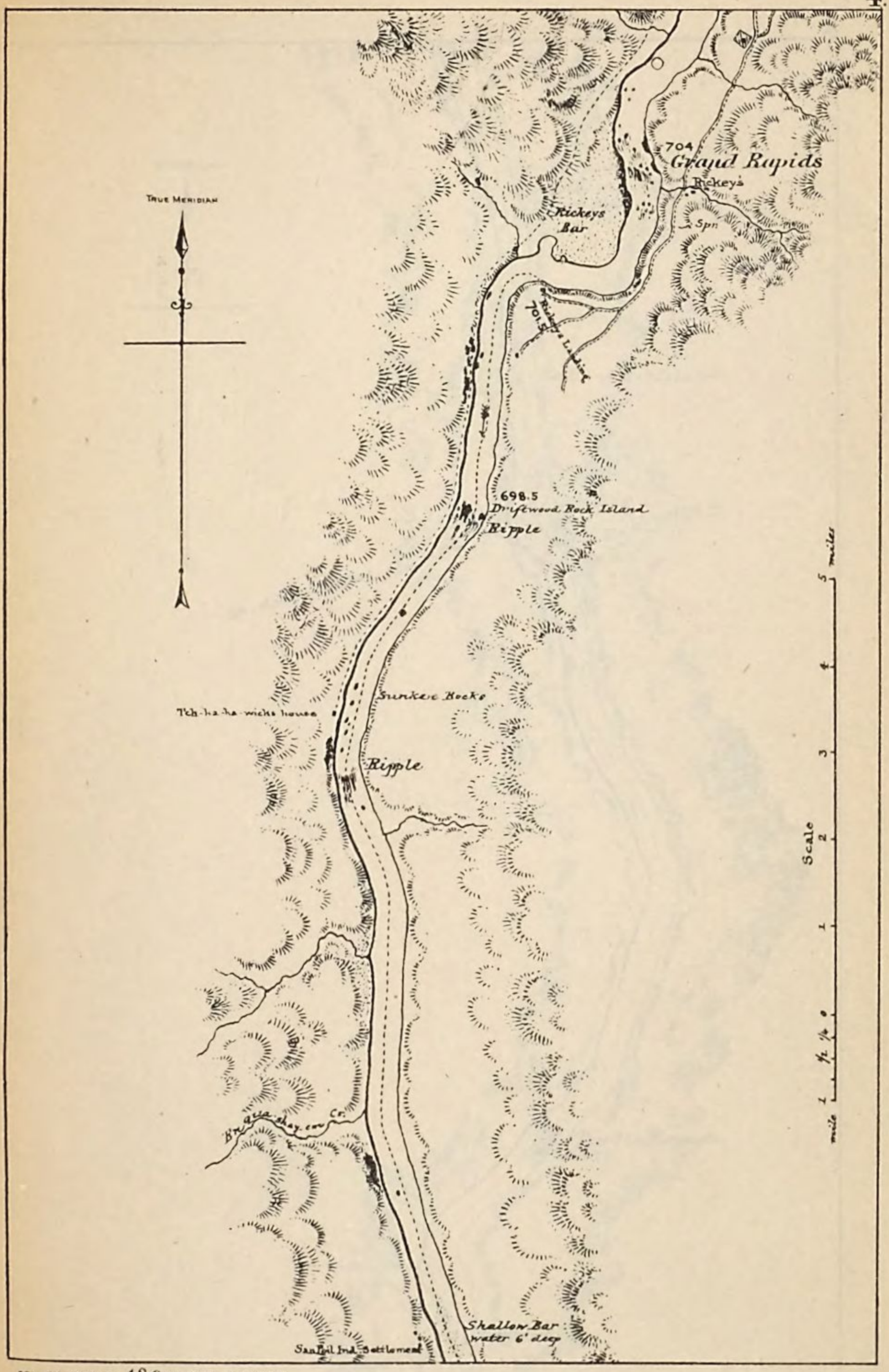


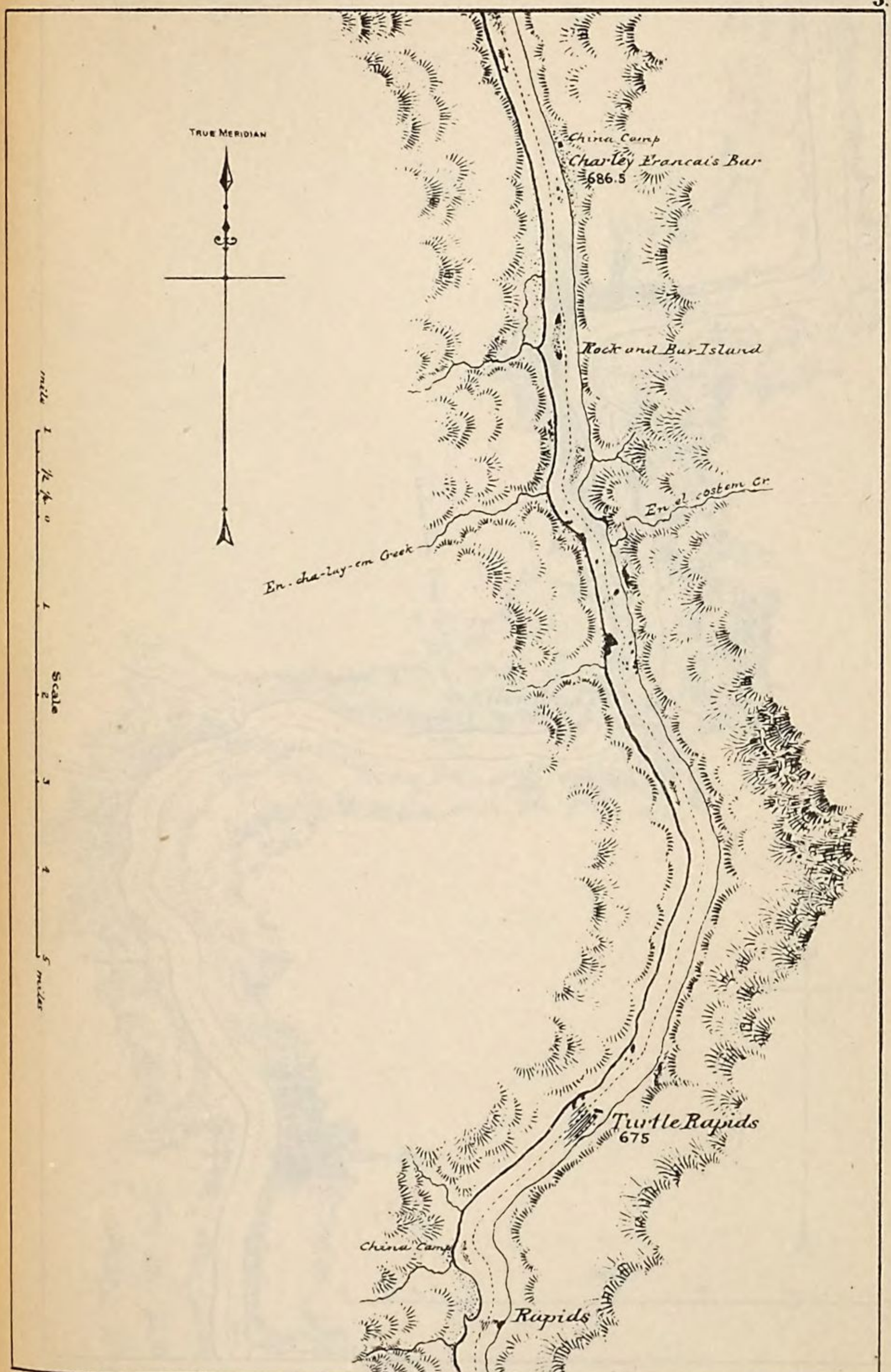
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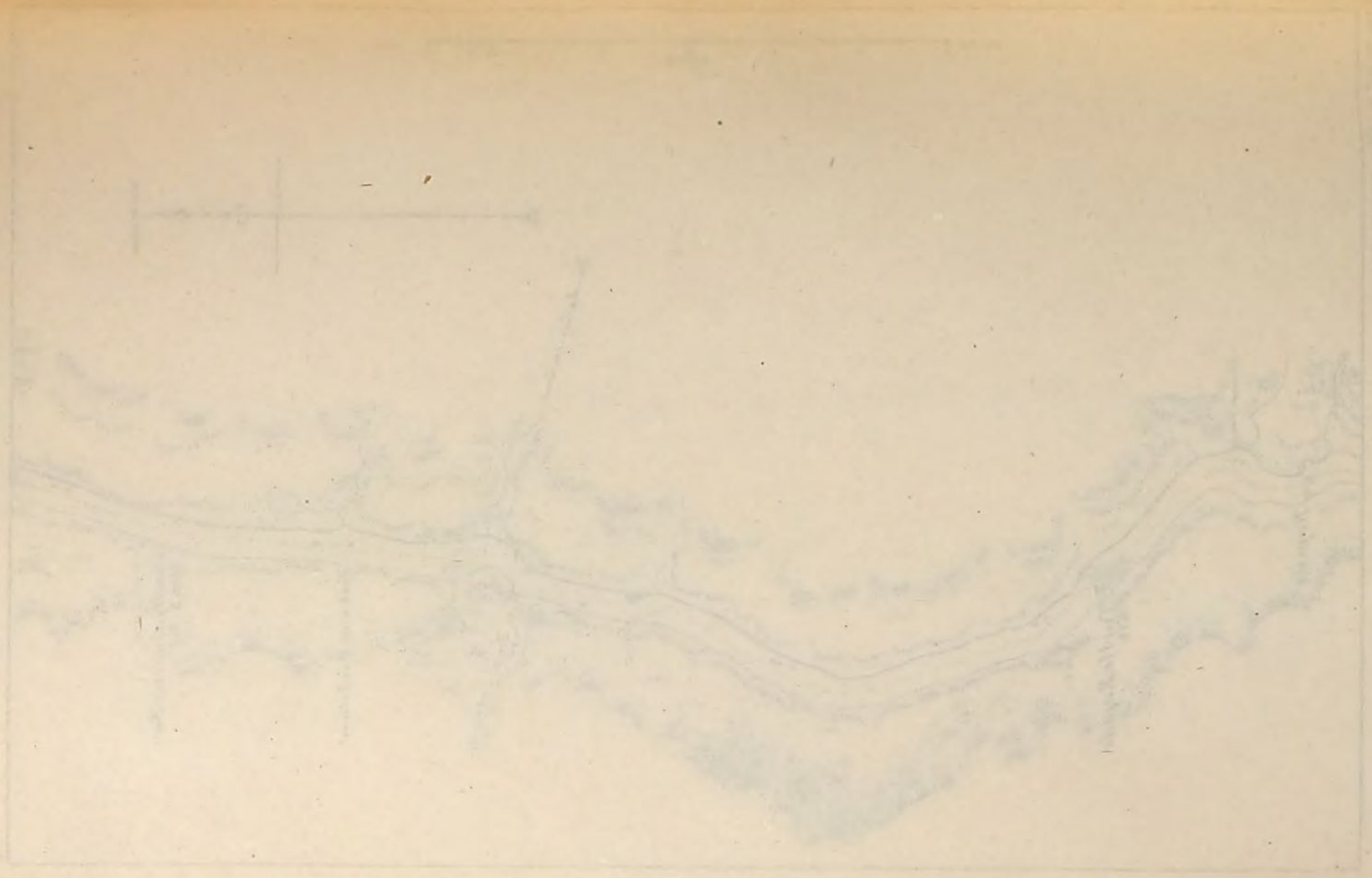
mile 1 ½ ¼ 0 1 2 3 4 5 miles

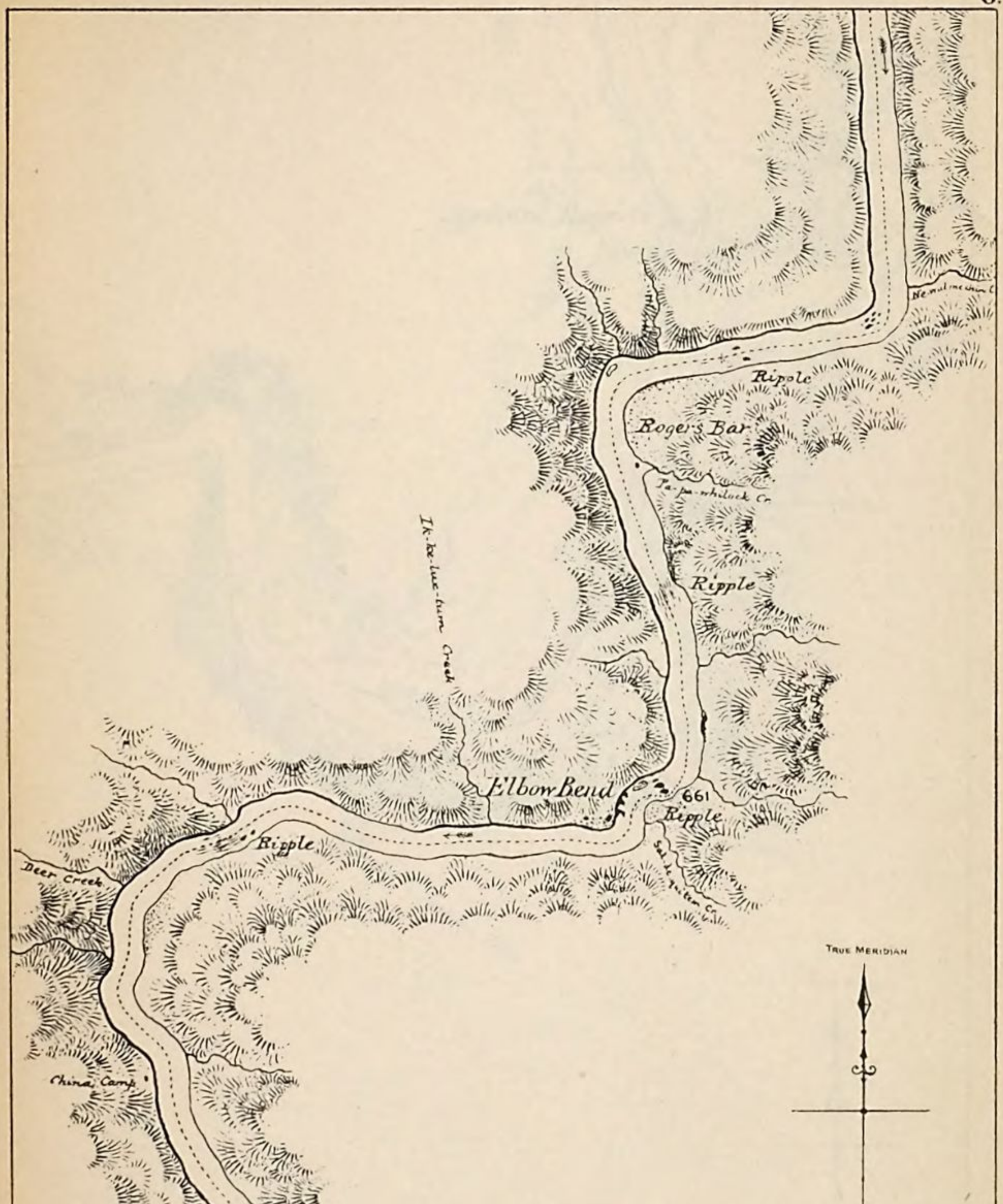

Onion creek
Little Dalles
737
Twelve Mile Bar
726
to Ft. Colville
True Meridian
Scale
mile
1
½
¼
0
1
2
3
4
5 miles


Twelve Mile Bar
726
Six Mile Bar
720
Kettle River
TRUE MERIDIAN
Indian Houses
OLD FORT COLVILLE
714
OLD HUDSON BAY COMPY FORT
Kettle Falls
711
OLD MISSION CHURCH
Mission
Mayers Mill
Jones Creek
Colville River
Bridge
707
Scale
2
3
1
5 miles

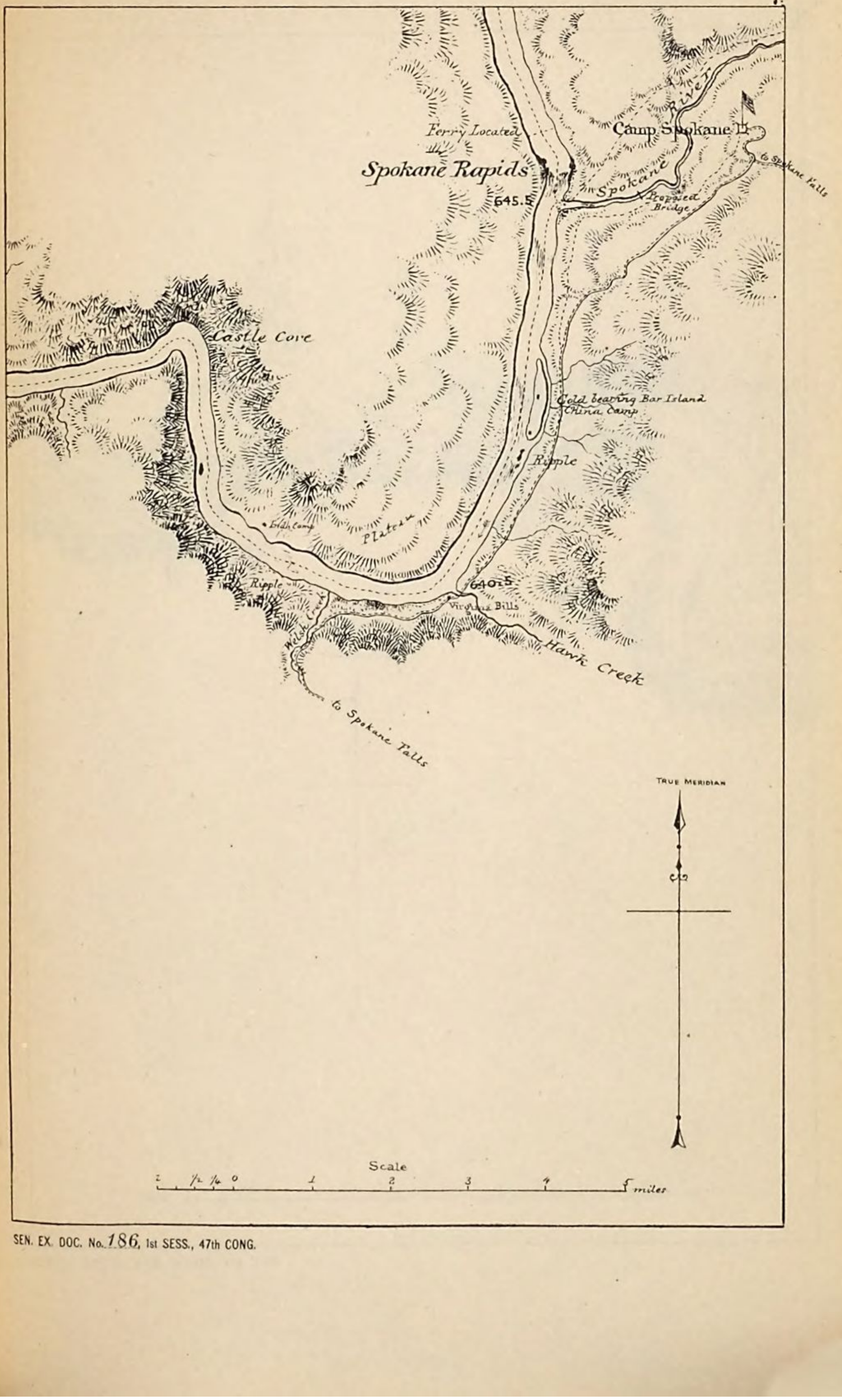

True Meridian
704
Grand Rapids
Rickey's
Rickeys Bar
Spn
Rickeys Landing
701.5
698.5
Driftwood Rock Island
Ripple
Sunkeve Rocks
Tch-ha-ha-wicks house
Ripple
Shallow Bar
water 6' deep
Scale
1
2
3
4
5 miles


TRUE MERIDIAN
China Camp
Charley Francais Bar
686.5
Rock and Bar Island
En el costem Cr.
En-cha-lay-em Creek
Scale
1 mile
5 miles
Turtle Rapids
675
China Camp
Rapids

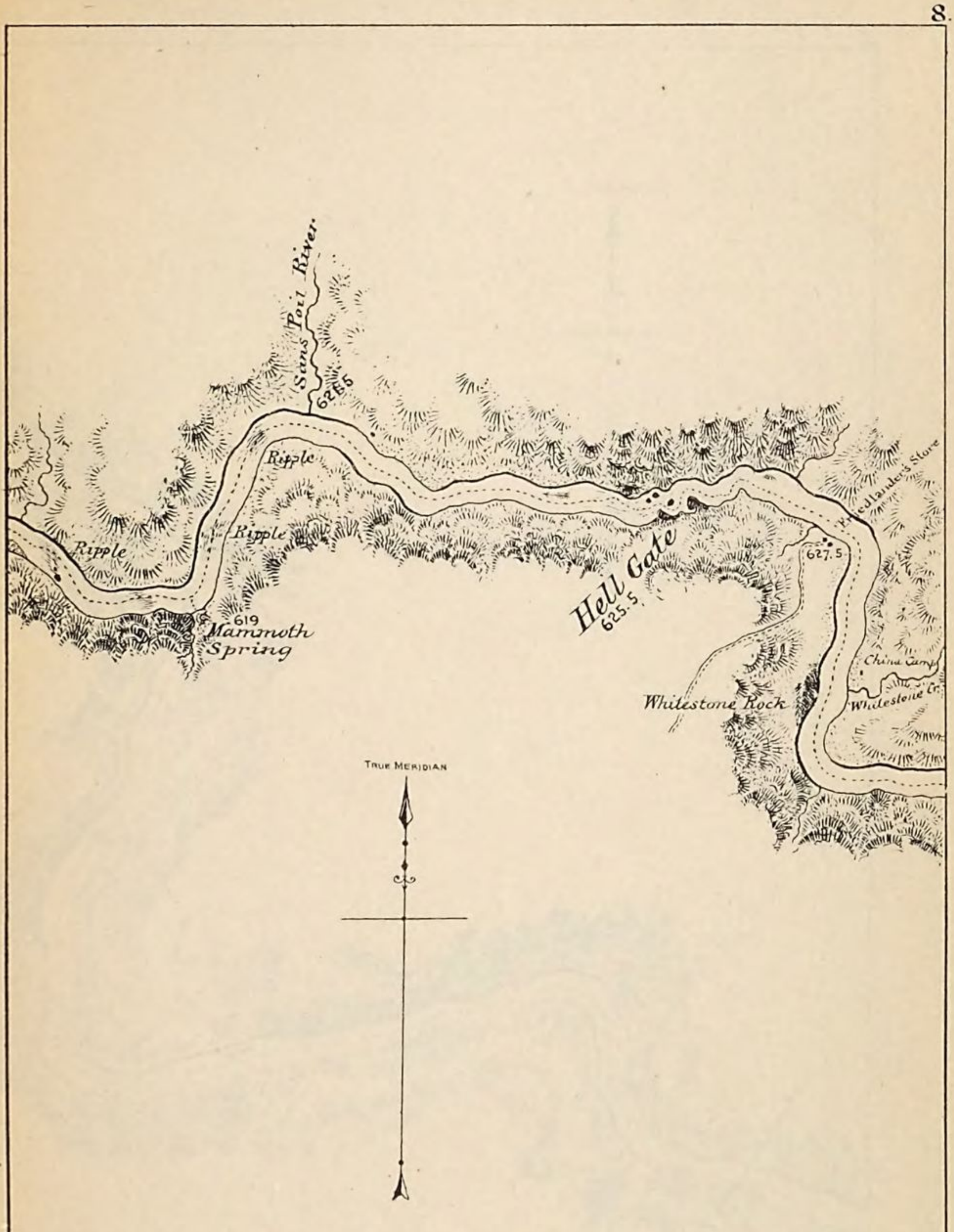


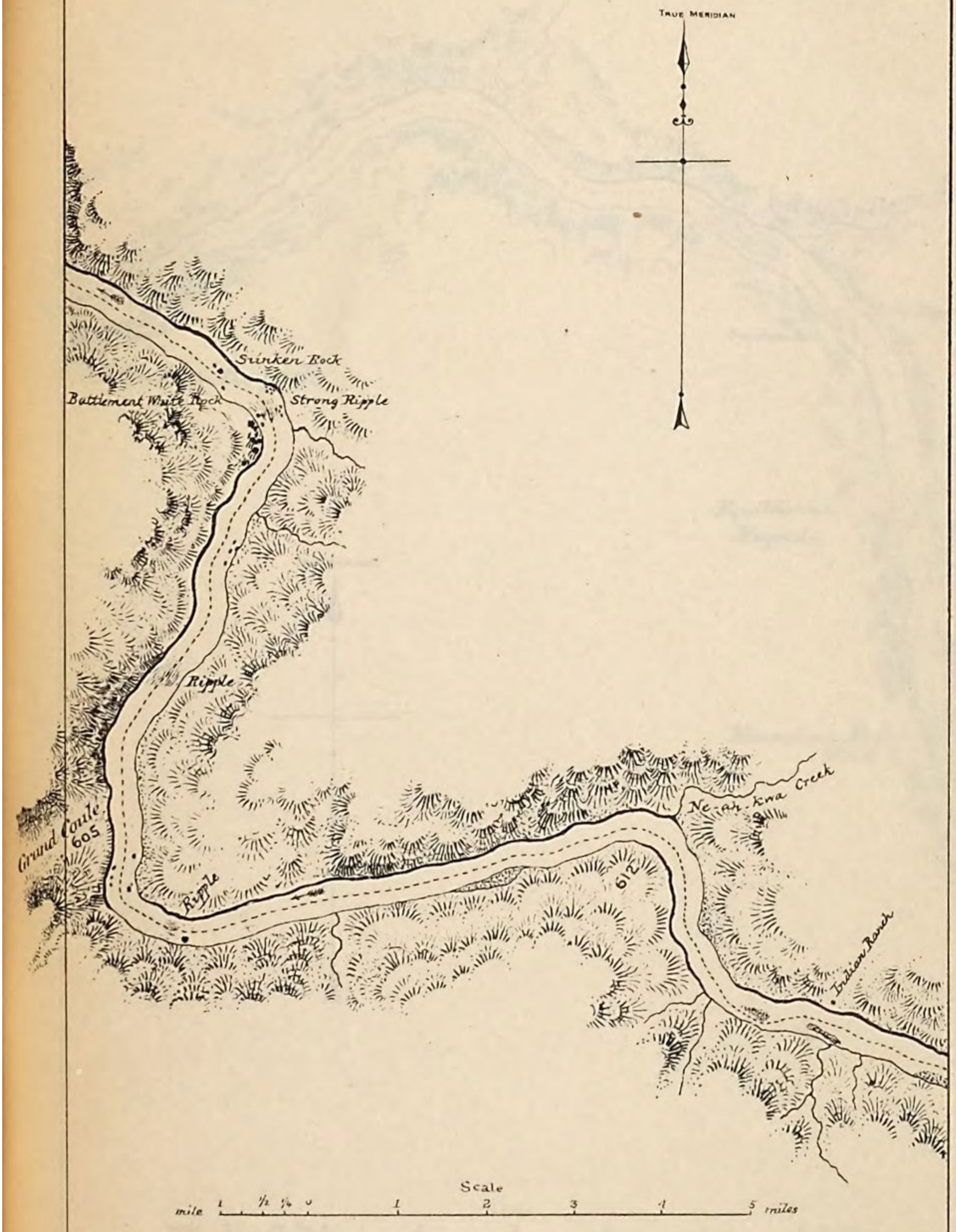

Ripple
Roger's Bar
Ripple
Elbow Bend
661
Ripple
Ripple
Deer Creek
China Camp
650
Mitre Rock
TRUE MERIDIAN
Scale
1 ½ ¼ 0 1 2 3 4 5 miles

7.

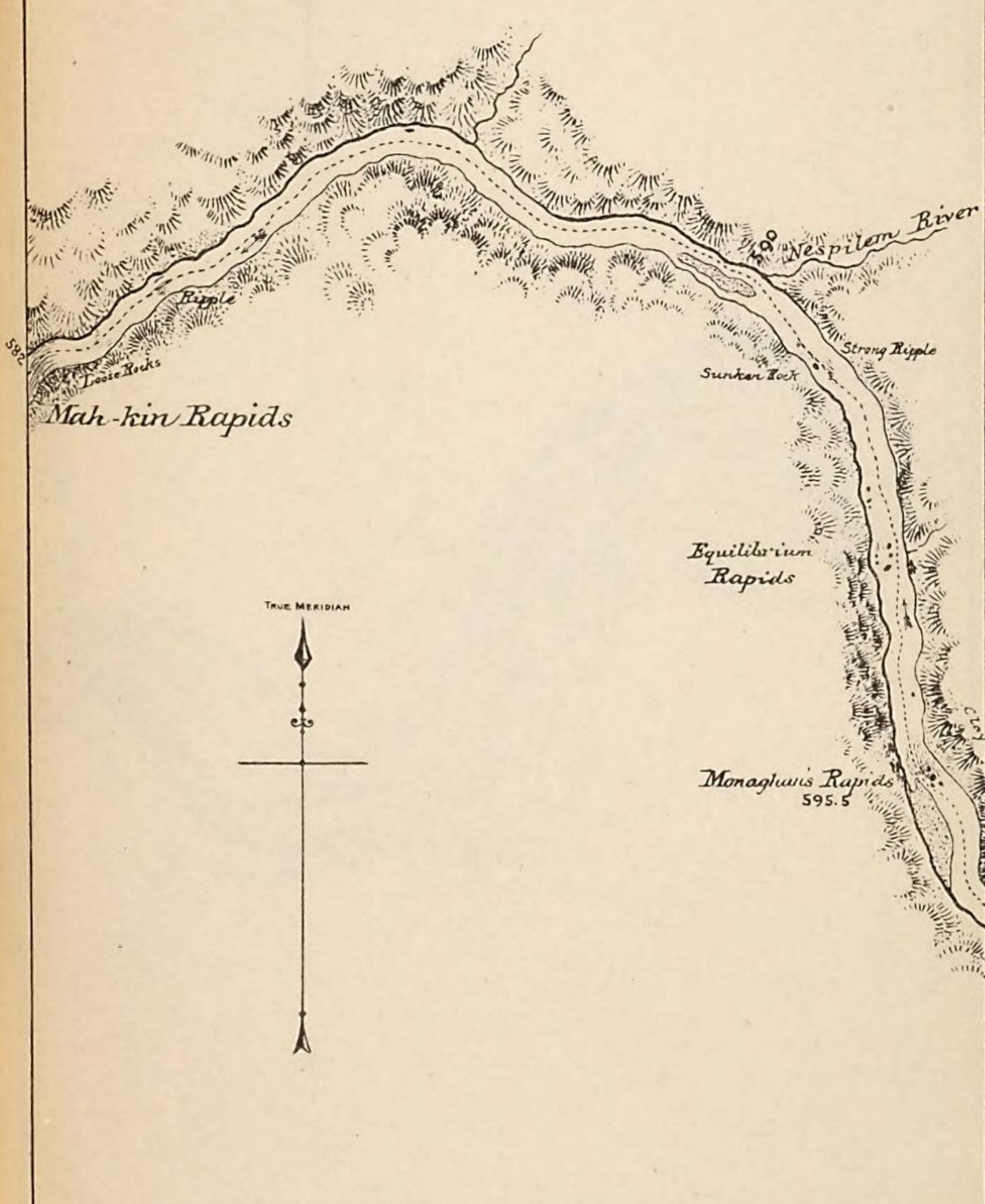


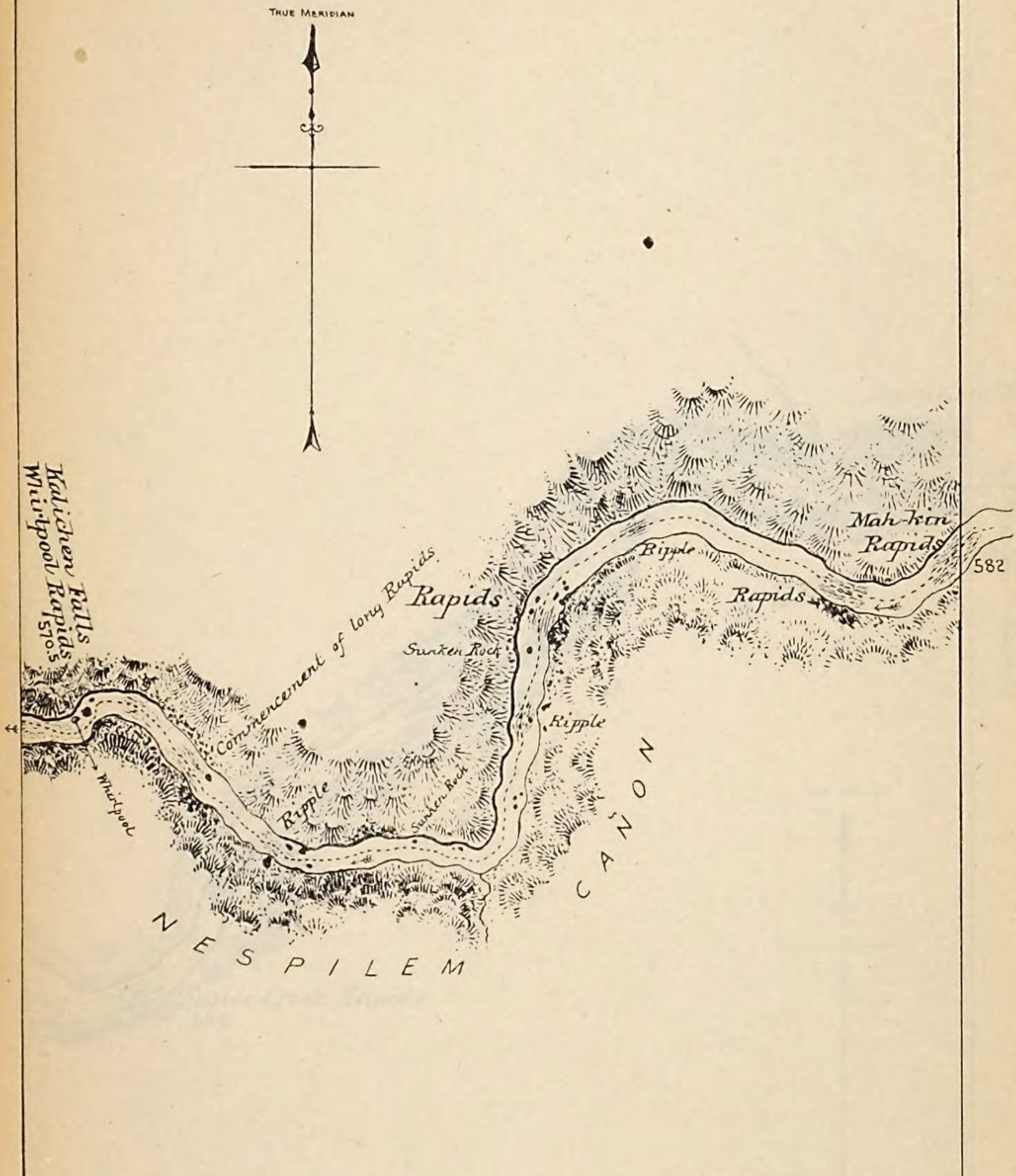
SEN. EX. DOC. No. 186, 1st SESS., 47th CONG.


Sans Poil River.
625
Ripple
Ripple
Ripple
619
Mammoth Spring
Hell Gate
625.5
627.5
Friedlander's Store
China Camp
Whitestone Rock
Whitestone Cr.
TRUE MERIDIAN
Scale
mile
1/2
1/4
0
1
2
3
4
5
miles



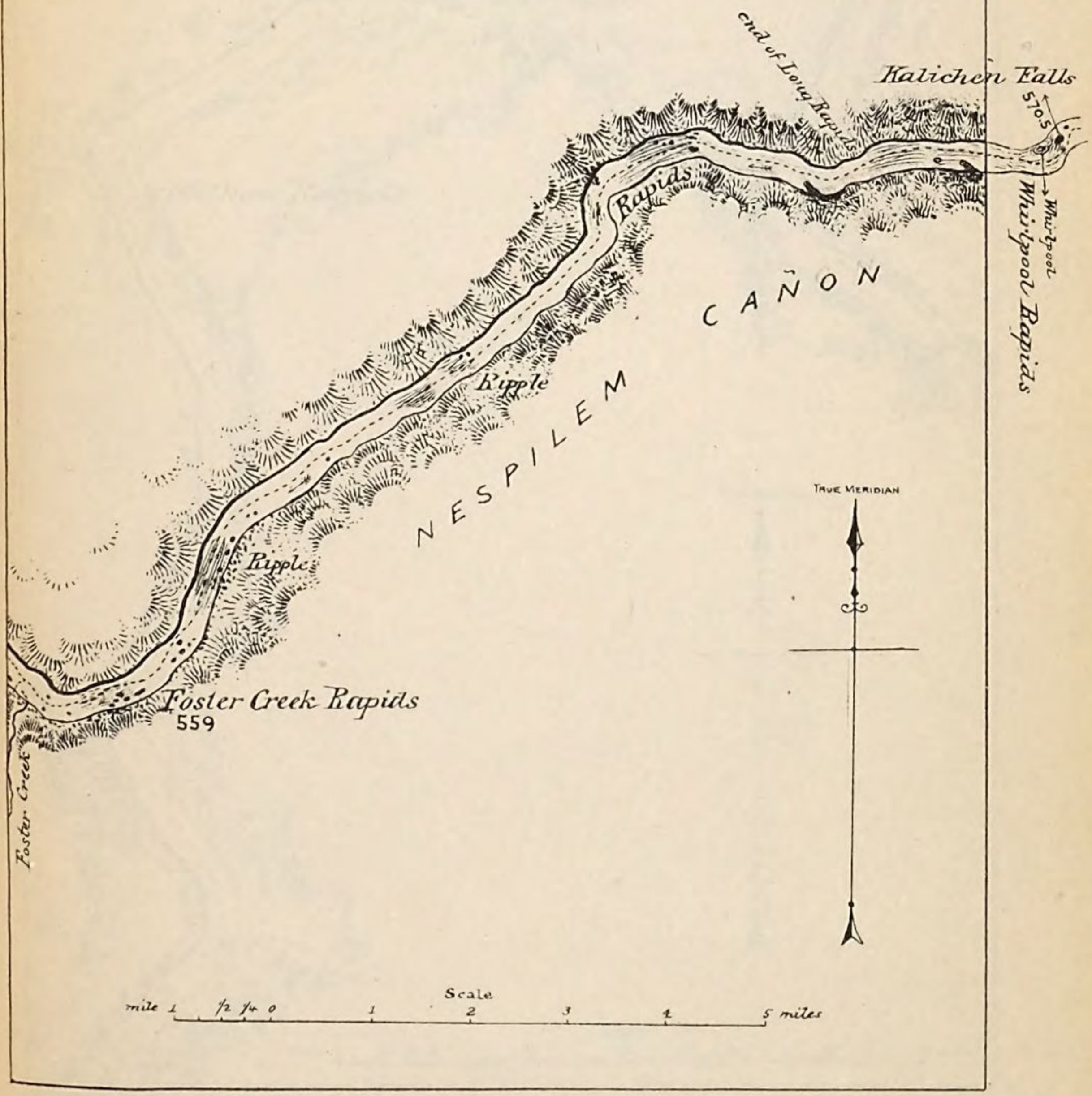
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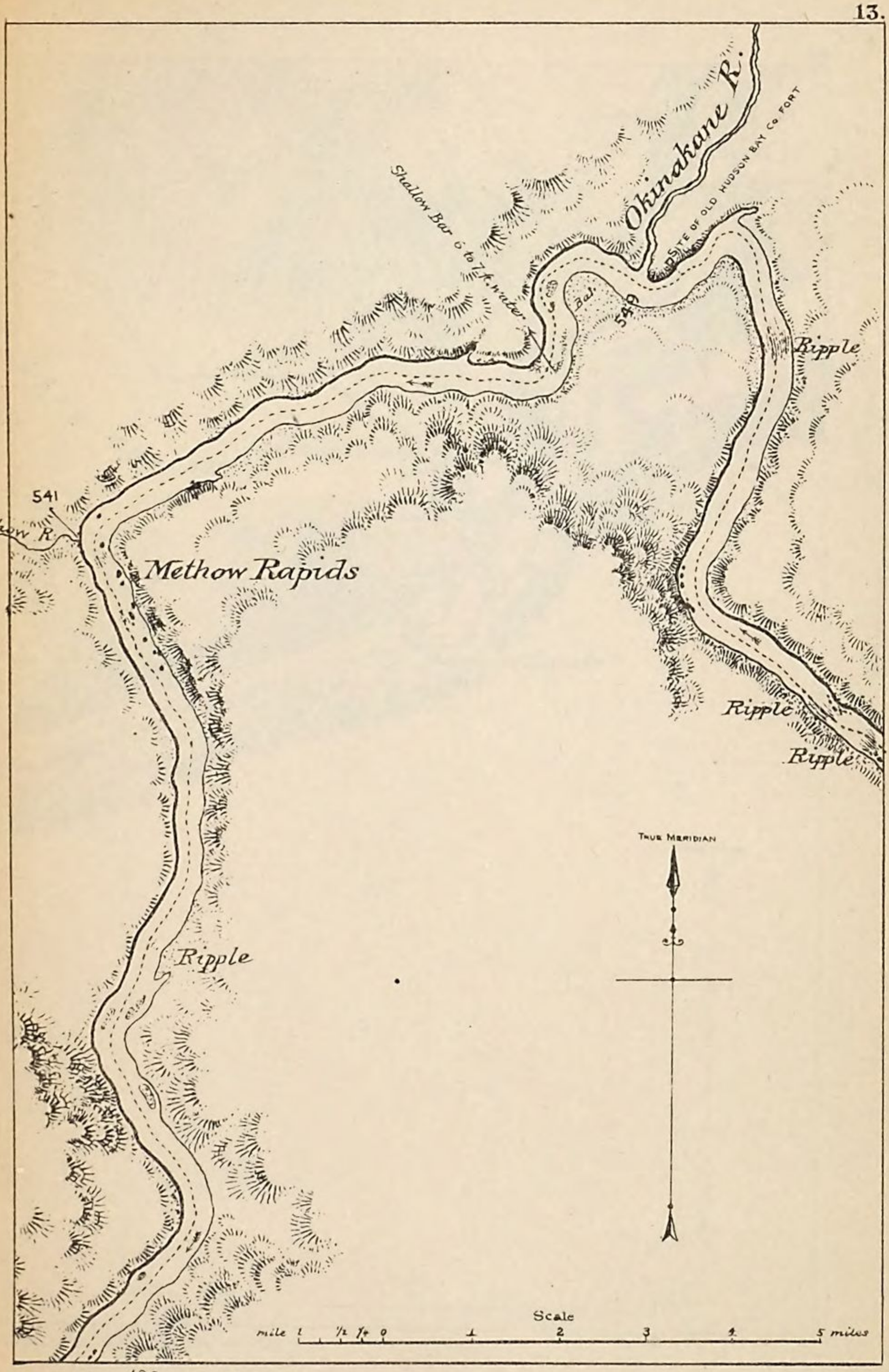

590
Nespilem River
Ripple
582
Loose Rocks
Mah-kin Rapids
Strong Ripple
Sunken Rock
Equilibrium Rapids
Monaghans Rapids
595.5
TRUE MERIDIAN
Scale
mile 1 ½ ¼ 0 1 2 3 4 5 miles



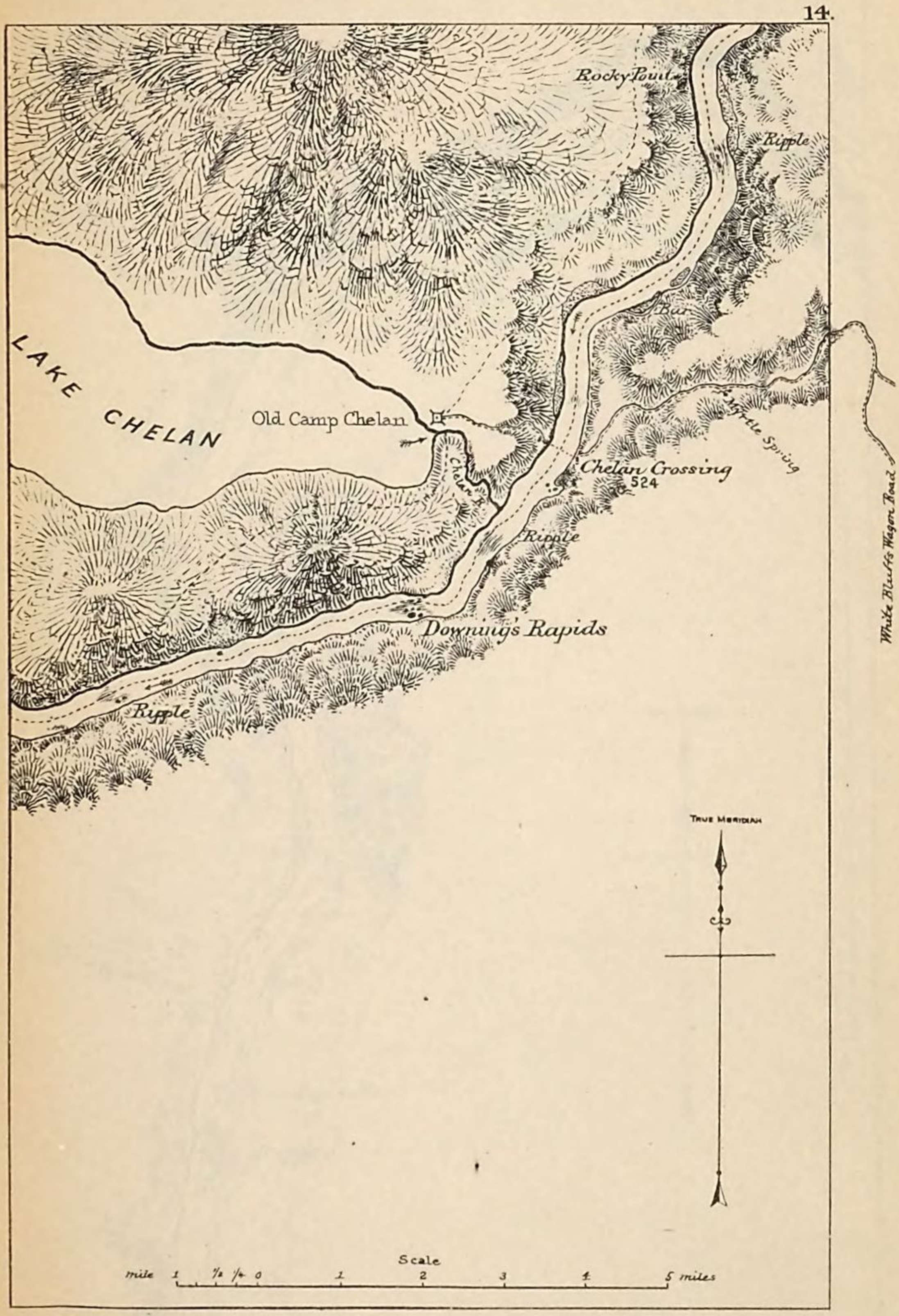
Scale

mile 1 1/2 1/4 0 1 2 3 4 5 miles

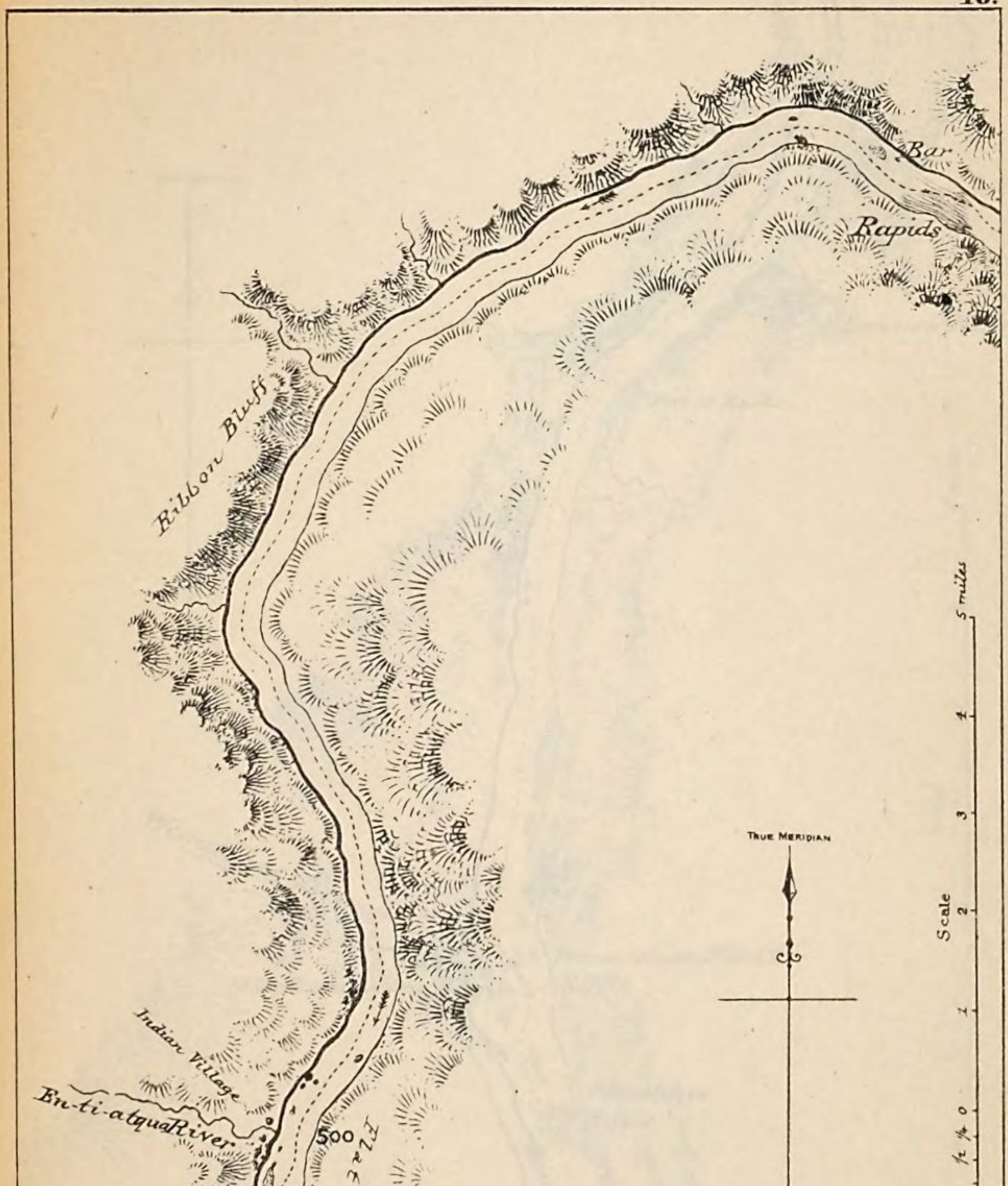

end of Long Rapids
Katichen Falls
570.5
Whi-Gpool
Whi-Gpool Rapids
CAÑON
NESPILEM
Rapids
Ripple
Ripple
Foster Creek Rapids
559
Foster Creek
TRUE MERIDIAN
Scale
mile 1 1/2 1/4 0 1 2 3 4 5 miles

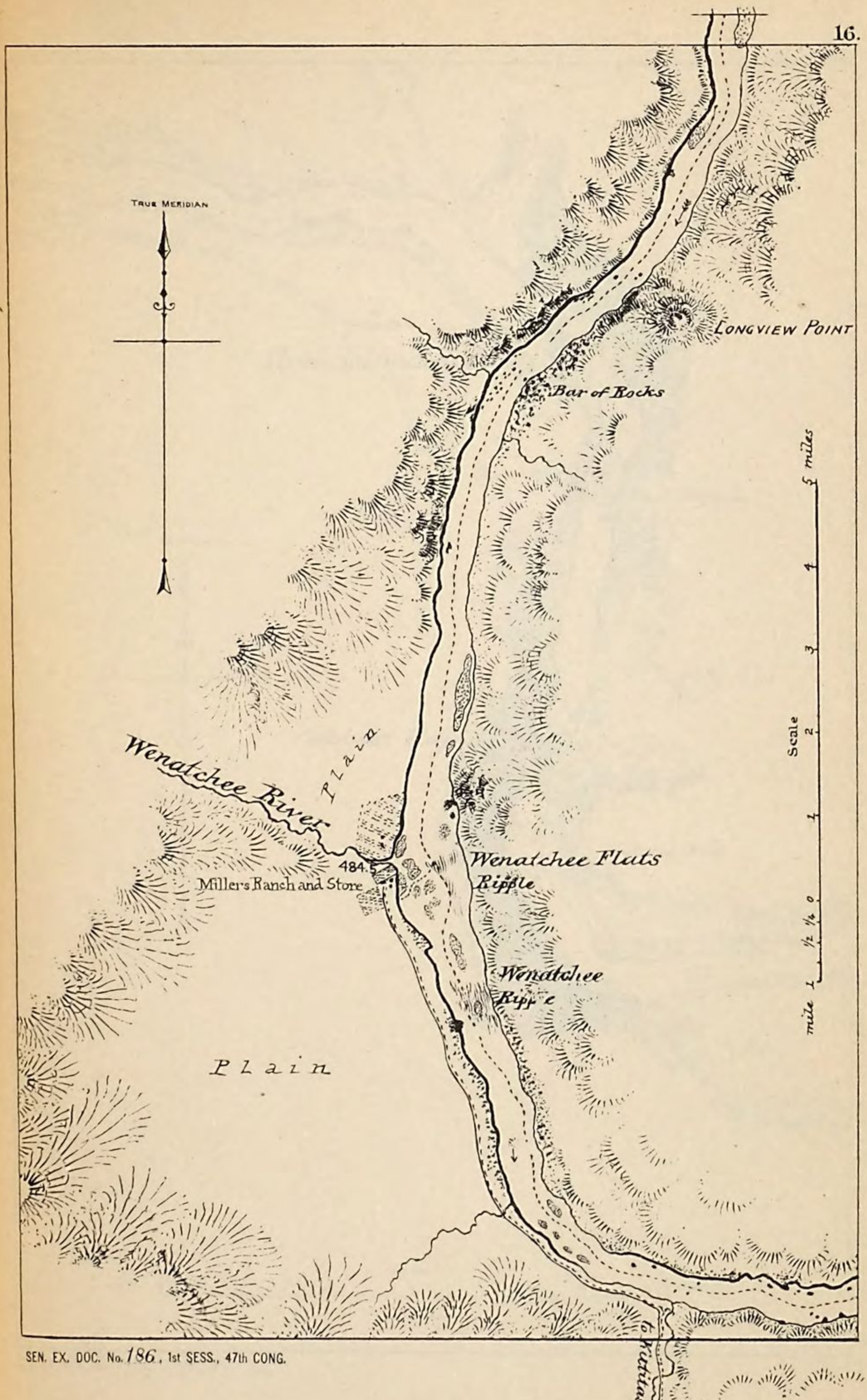

Okinakane R.
SITE OF OLD HUDSON BAY Co FORT
Shallow Bar 6 to 7 ft. water
Bar
549
Ripple
541
Methow R.
Methow Rapids
Ripple
Ripple
Ripple
TRUE MERIDIAN
Scale
mile 1 1/2 1/4 0 1 2 3 4 5 miles

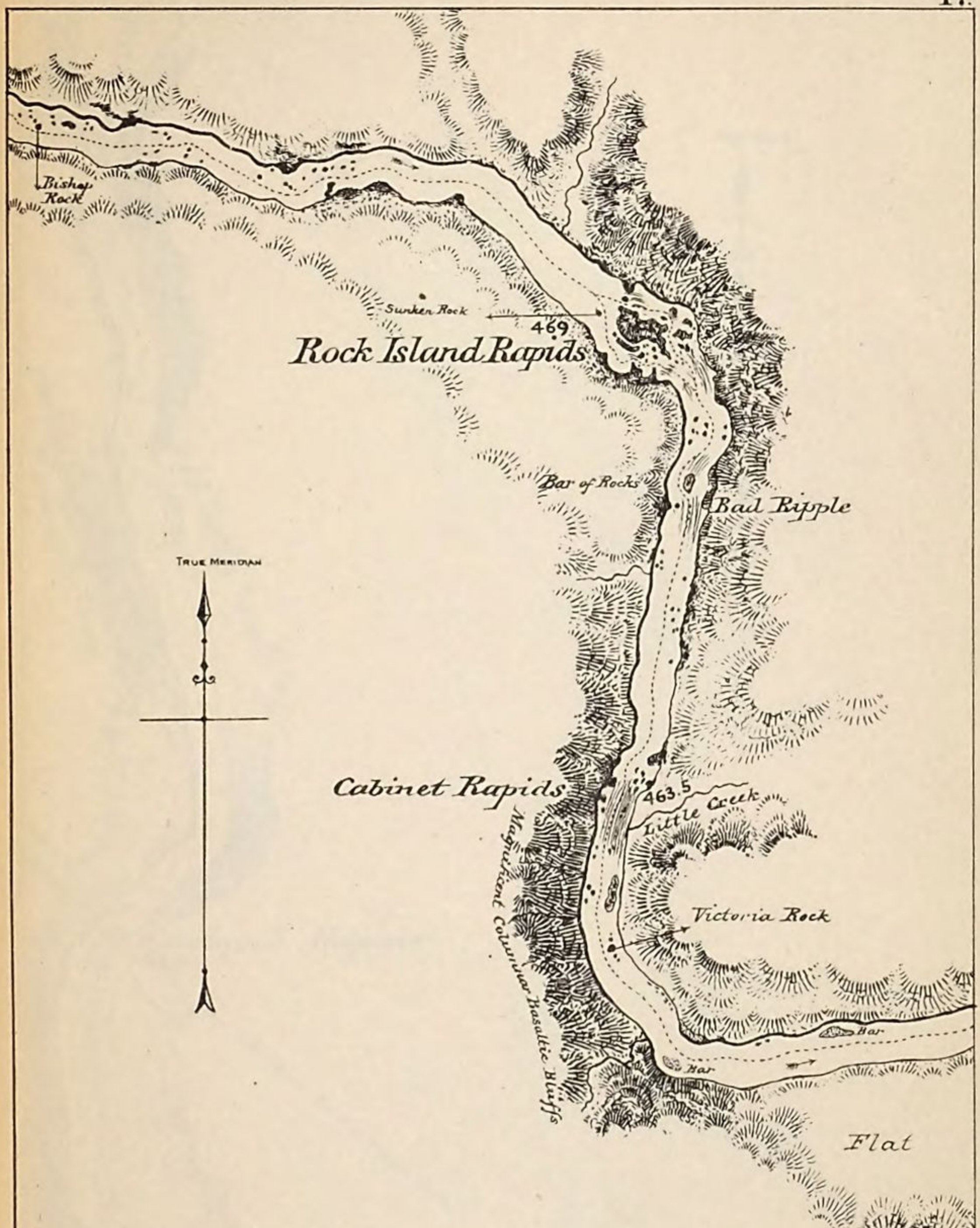
14.

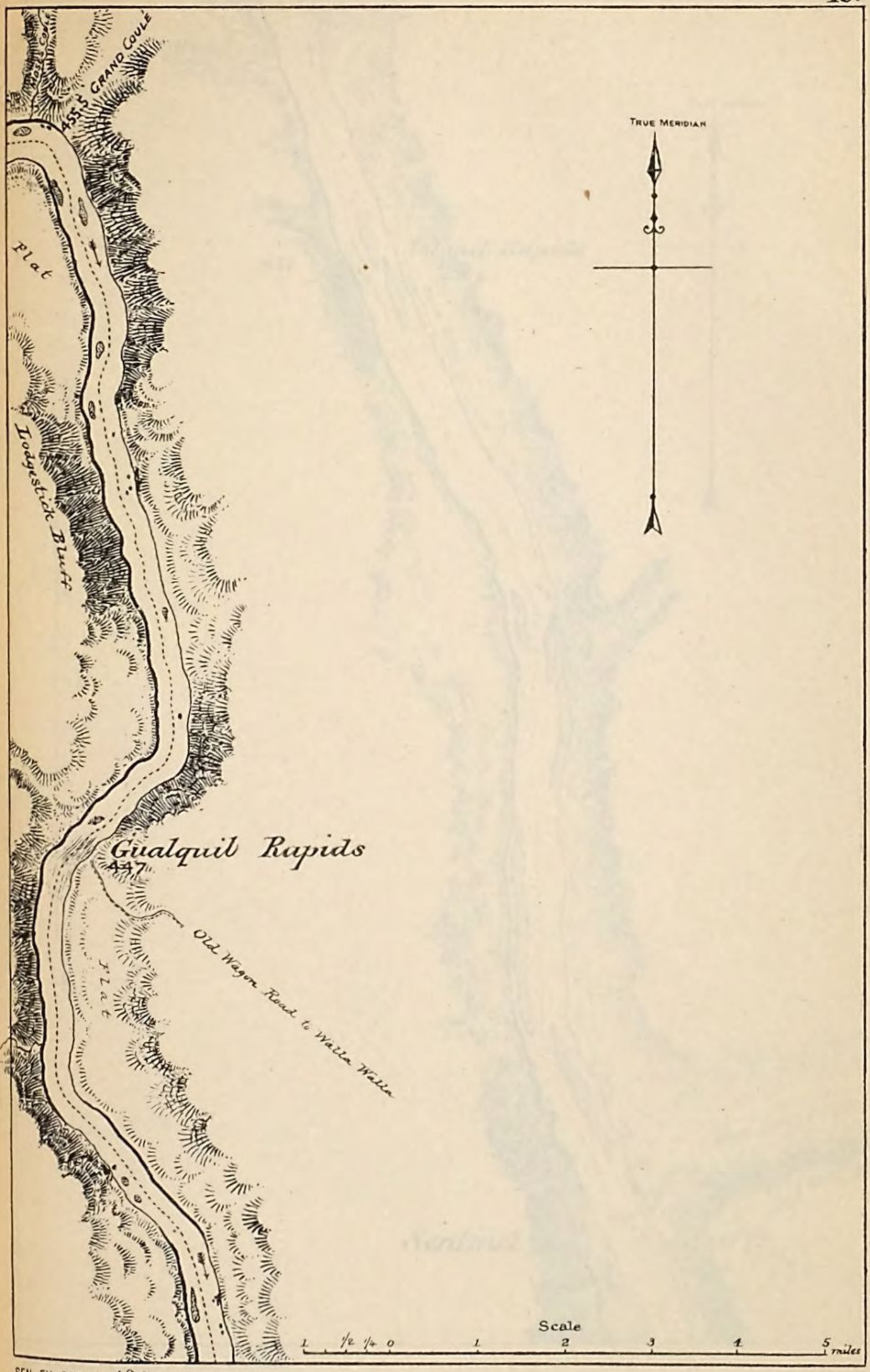


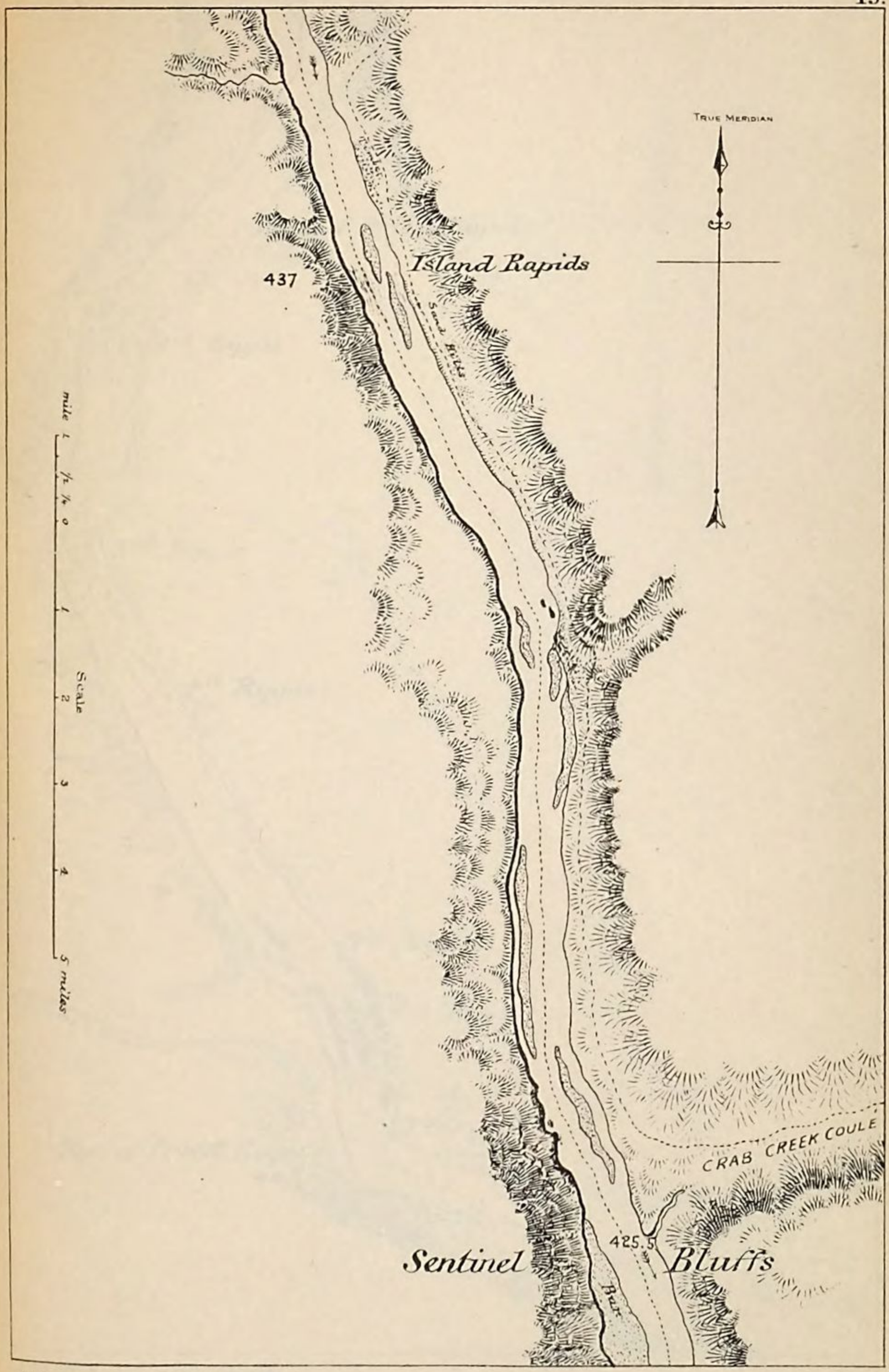
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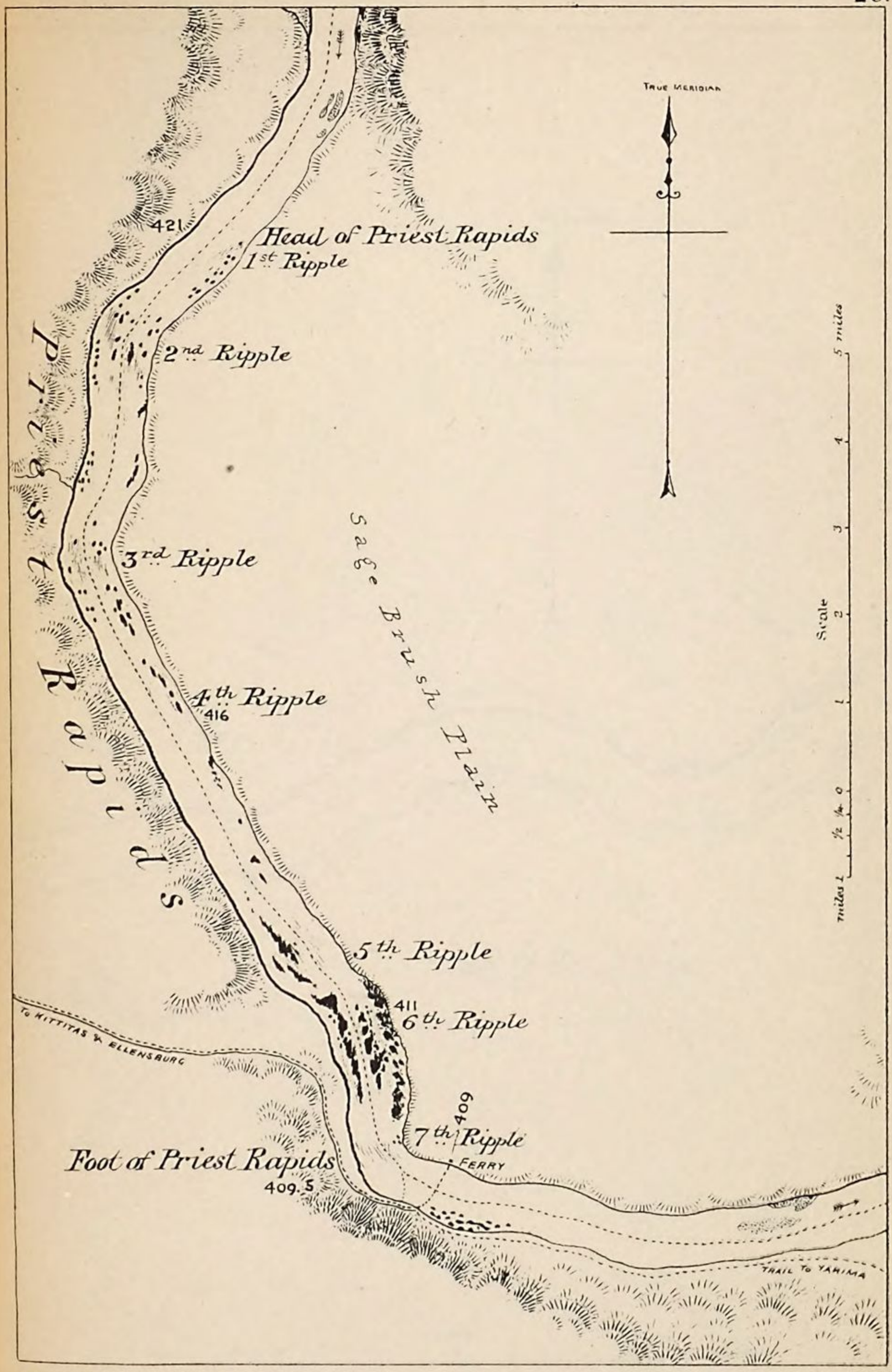

Bar
Rapids
Ribbon Bluff
TRUE MERIDIAN
Scale
5 miles
4
3
2
1
mile
Indian Village
En-ti-atqua River
500
Entiatqua Bar
Ripple

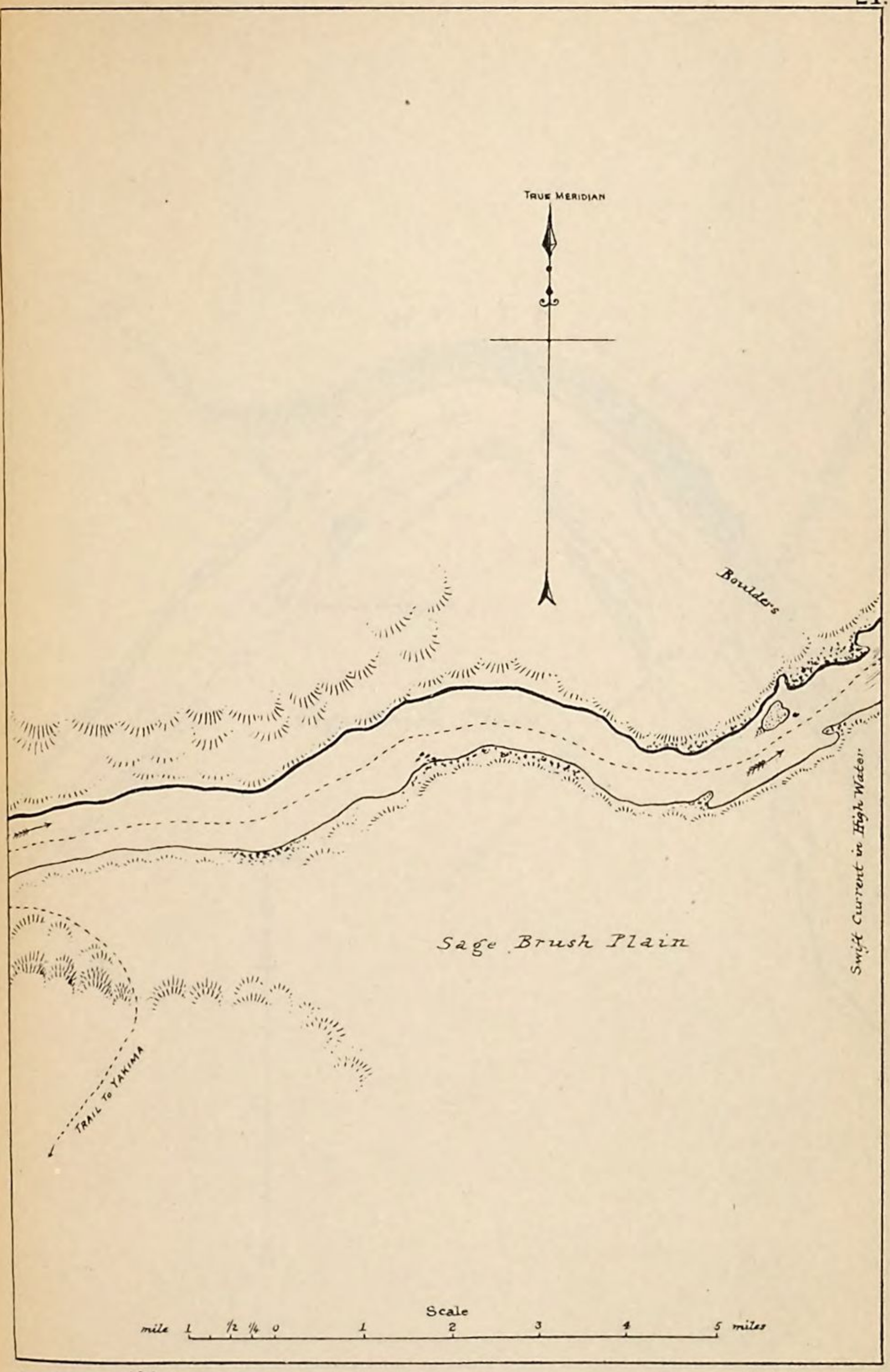

TRUE MERIDIAN
LONGVIEW POINT
Bar of Rocks
5 miles
Scale
4
3
2
1
½ ¼ 0
mile 1
Wenatchee River
Plain
Miller's Ranch and Store
484.5
Wenatchee Flats
Ripple
Wenatchee
Ripple
Plain
to Entiat

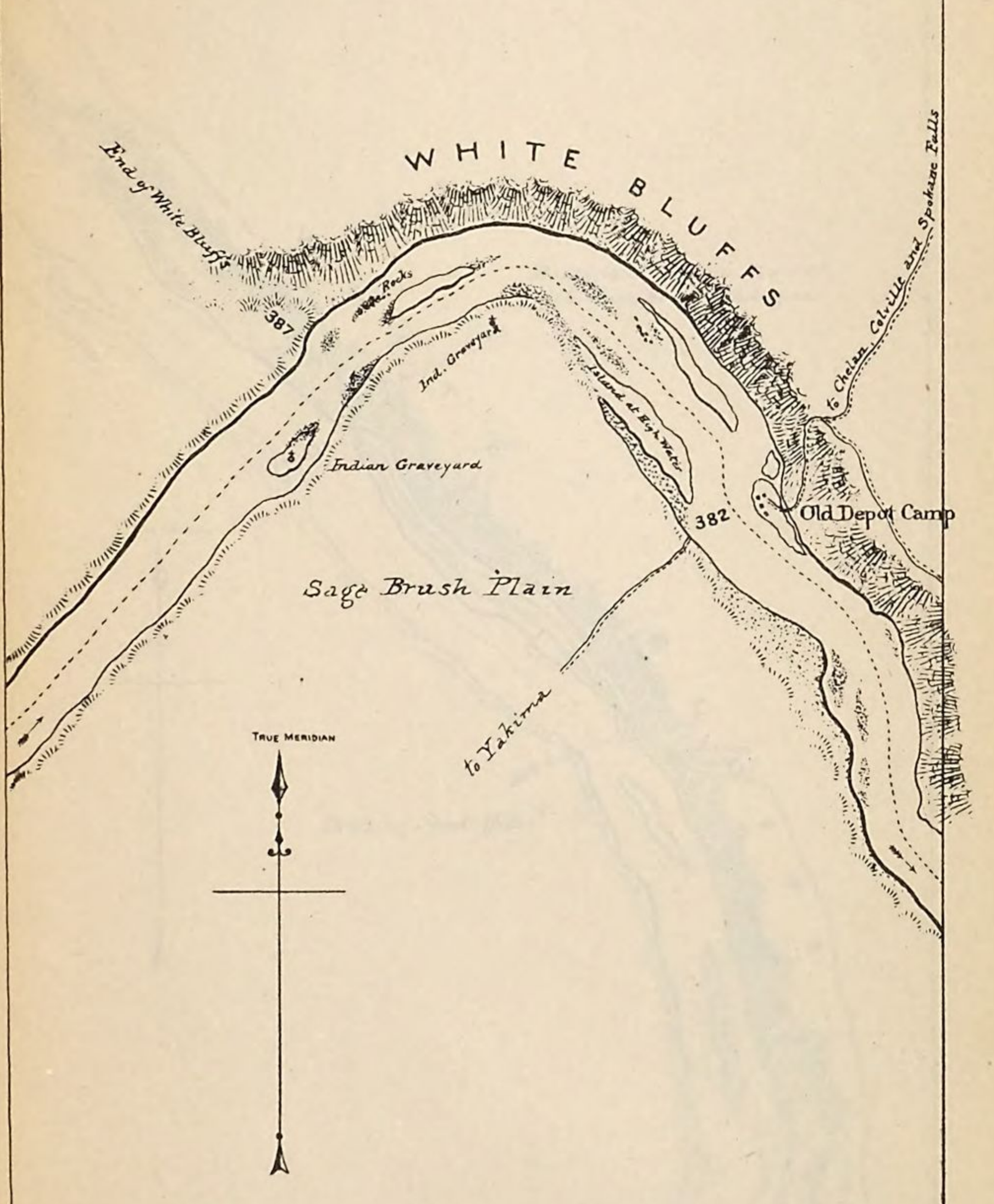

Bishop Rock
Sunken Rock
469
Rock Island Rapids
Bar of Rocks
Bad Ripple
TRUE MERIDIAN
Cabinet Rapids
463.5
Little Creek
Victoria Rock
Magnificent Columnar Basaltic Bluffs
Bar
Flat
Scale
mile 1 ½ ¼ 0 1 2 3 4 5 miles

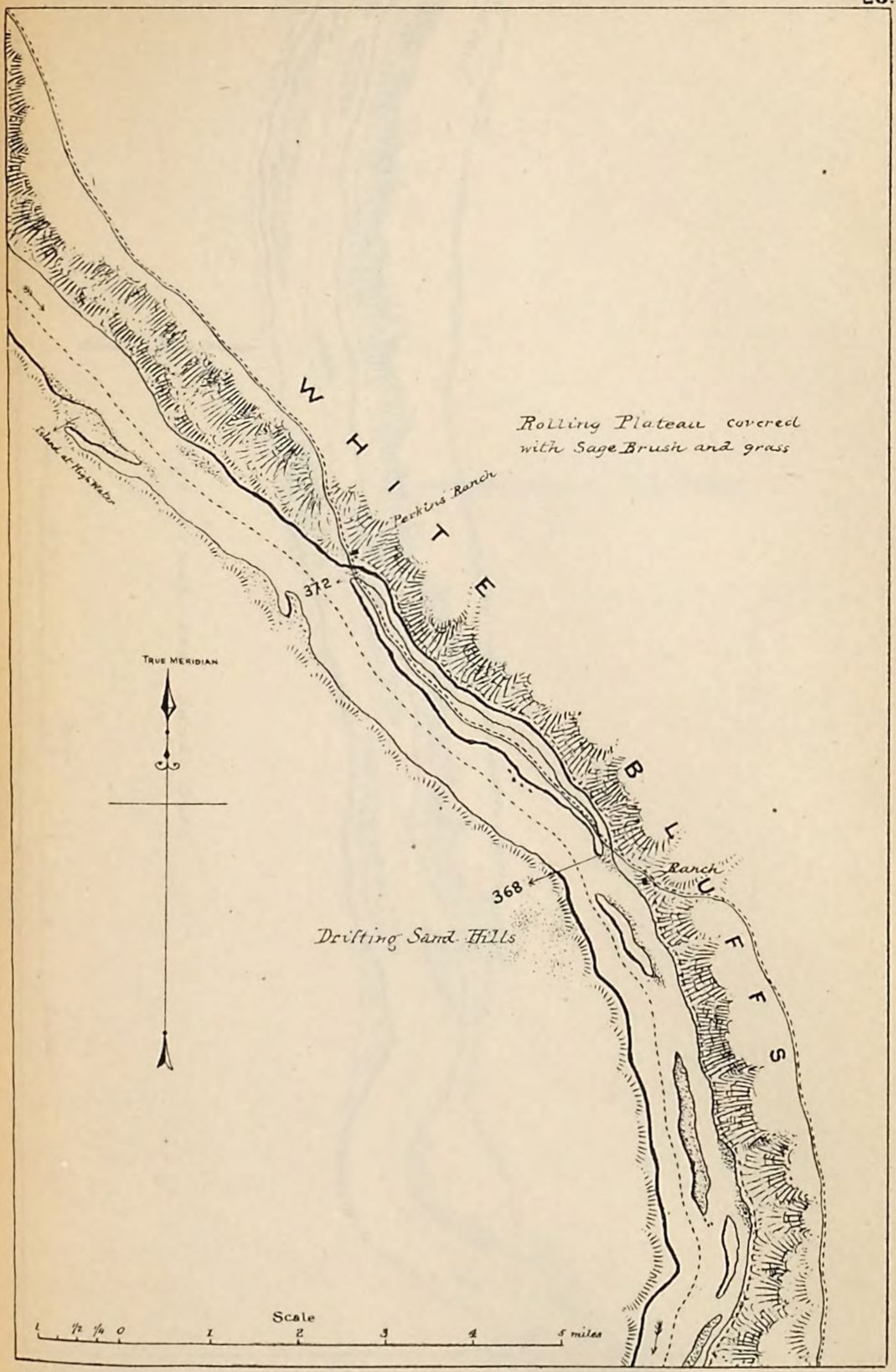

Grand Coulé
455
Flat
Lodgestick Bluff
Gualquil Rapids
447
Old Wagon Road to Walla Walla
Flat
True Meridian
Scale
1 1/2 1/4 0 1 2 3 4 5 miles

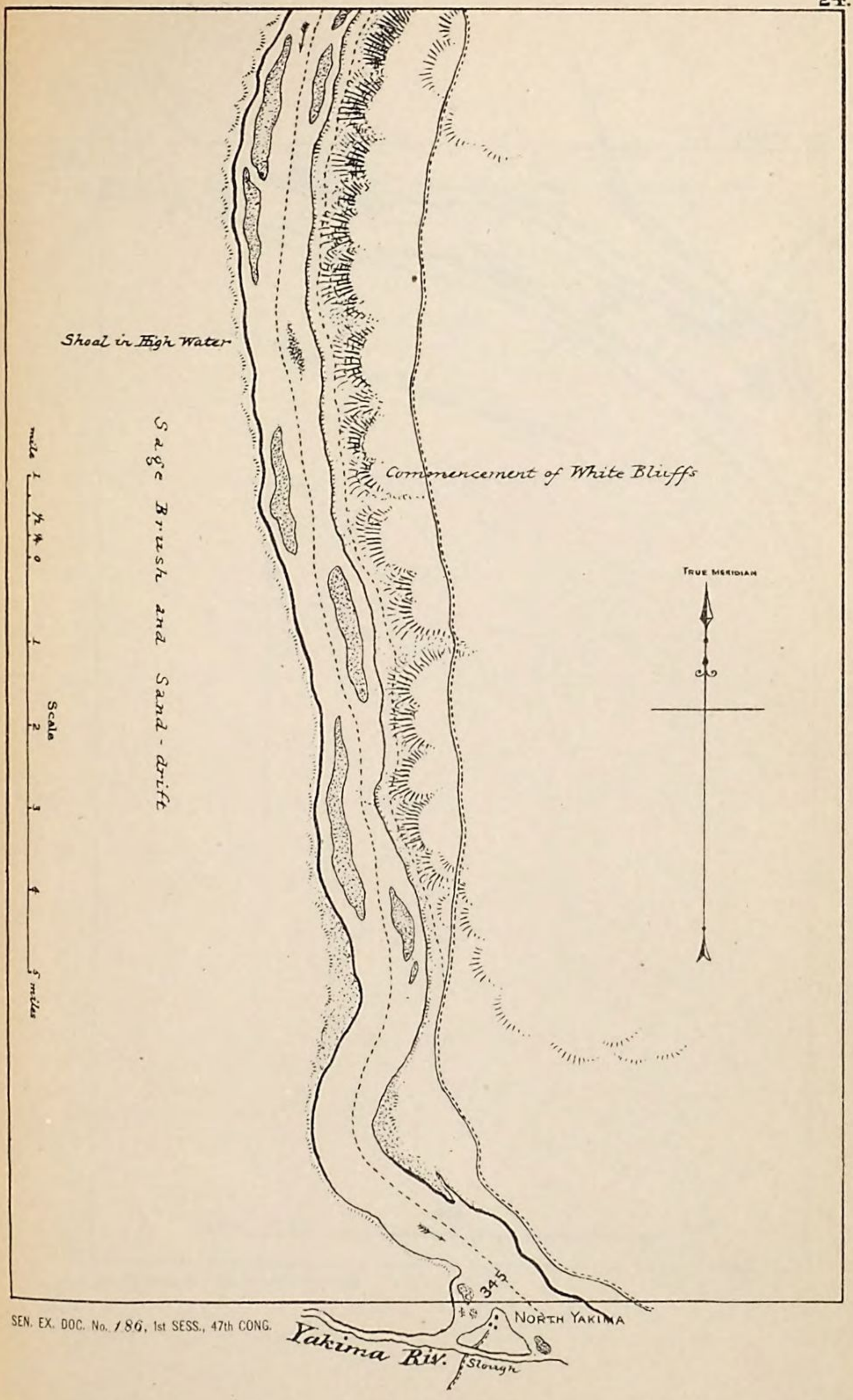

True Meridian
Island Rapids
437
Sand Hills
Scale
1 ½ 0 1 2 3 4 5 miles
CRAB CREEK COULE
425.5
Sentinel Bluffs
Bar


Head of Priest Rapids
1st Ripple
2nd Ripple
3rd Ripple
4th Ripple
5th Ripple
6th Ripple
7th Ripple
421
416
411
409
409.5
Foot of Priest Rapids
Rapids
Passage Brush Plain
TRUE MERIDIAN
Scale
5 miles
4
3
2
1
½ ¼ 0
miles
TO KITTITAS & ELLENSBURG
FERRY
TRAIL TO YAHIMA


True Meridian
Boulders
Swift Current in High Water.
Sage Brush Plain
TRAIL TO YAKIMA
Scale
mile 1 1/2 1/4 0 1 2 3 4 5 miles


WHITE BLUFFS
End of White Bluffs
387
Rocks
Ind. Graveyard
Island at High Water
to Chelan, Colville and Spokane Falls
Indian Graveyard
382
Old Depot Camp
Sage Brush Plain
to Yakima
TRUE MERIDIAN
Scale
mile 1 1/2 1/4 0 1 2 3 4 5 miles


WHITE
Rolling Plateau covered with Sage Brush and grass
Island at High Water
Perkins' Ranch
372
BLUFFS
Ranch
368
TRUE MERIDIAN
Drifting Sand Hills
Scale
1 ½ ¼ 0 1 2 3 4 5 miles


Shoal in High Water
Commencement of White Bluffs
Sage Brush and Sand-drift
mile
Scale
TRUE MERIDIAN
345°
NORTH YAKIMA
Yakima Riv.
Slough

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 187.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

A communication from the Secretary of War, dated the 9th instant, and accompanying copy of a telegram from the general commanding the Military Division of the Pacific and Department of California, relative to the construction of additional quarters, &c., within the limits of the Military Department of Arizona.

JUNE 26, 1882.—Referred to the Committee on Appropriations and ordered to be printed.

To the Senate and House of Representatives:

I transmit herewith a communication from the Secretary of War, dated the 9th instant, and its accompanying copy of a telegram from the general commanding the Military Division of the Pacific and Department of California, relative to the construction of additional quarters, barracks, store-houses, &c., within the limits of the Military Department of Arizona.

The Secretary of War recommends that, for the purpose of constructing the additional buildings referred to, the sum of their estimated cost ($205,000) be appropriated during the present session of Congress.

CHESTER A. ARTHUR.

EXECUTIVE MANSION,
June 26, 1882.

WAR DEPARTMENT,
Washington City, June 9, 1882.

SIR: I have the honor to inclose herewith, with request for its transmission for the consideration of Congress, a copy of a telegram of the 21st ultimo from the commanding general Military Division of the Pacific and Department of California, repeating a dispatch received by him from the commanding general Department of Arizona, relative to the construction of additional quarters, barracks, store-houses, &c., within the limits of that department, the estimated cost of which is $205,000.

Upon receipt of this telegram instructions were given, by telegraph, that plans and estimates for the proposed buildings be prepared and forwarded without delay, so that the matter might be more fully presented to Congress. In reply, the division commander reported, by telegraph, that he had been informed by the general commanding the

Department of Arizona that some three or four weeks would be required in which to complete the detailed plans and estimates, and requested that meanwhile an appropriation be asked of Congress on the basis of his dispatch of the 21st ultimo.

In view of these facts, and of the further fact that the additional buildings referred to are urgently needed in consequence of the number of troops ordered into that department for protection against Indian outbreaks, I respectfully recommend that an appropriation for their construction, in the sum of their estimated cost ($205,000), as set forth in the inclosed telegram, be made during the present session of Congress.

Very respectfully, your obedient servant,

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT.

[Telegram.]

PRESIDIO, via SAN FRANCISCO, *May* 21, 1882.

ADJUTANT-GENERAL UNITED STATES ARMY,
Washington, D. C.:

The following dispatch, addressed to you for the consideration of the General of the Army, is just received from the commanding general Department of Arizona. He telegraphs:

"We can build at Huachuea one field-staff and four-company quarters, barracks, guard-house, offices store-houses, and stables for $52,000, susceptible of enlargement to an eight-company post at an increased cost of $30,000, making an eight-company post, four of cavalry and four of infantry, at a total cost of $82,000.

"For Grant we require four barracks, quarters, stables, and grain-house for four additional companies of cavalry and one of infantry, and one field office, $62,000. At Fort Apache, $61,000 for barracks, quarters, and stables for one field officer and four companies of cavalry.

"If decided to build only a four-company post at Huachuea this year, I recommend that $30,000 be appropriated for building two additional cavalry-company barracks and quarters at Fort Thomas; the total recommended being $205,000.

"Detailed plans and specifications in conformity with foregoing outlined estimates will be prepared and forwarded without delay if contemplated expenditures will be approved and authorized estimates for contemplated post south of Chiricahua Mountains deferred till location is fixed, which, according to instructions of the General of the Army, must be on line of Atchison, Topeka, Santa Fé and Sonora Railway, not yet definitely located. Estimates for enlarging Fort Whipple or new post near Atlantic and Pacific Road deferred till question of Prescott Branch Railroad is determined."

McDOWELL,
Commanding Military Division of the Pacific.

[First indorsement.]

HEADQUARTERS OF THE ARMY,
Washington, May 22, 1882.

ADJUTANT-GENERAL:

Notify General McDowell to have the plans and estimates for Huachuea, Grant, and Apache hastened, that an appropriation may be obtained if possible at this session.

The others can wait. The permanent force for Arizona will probably be two regiments of infantry and *one* of cavalry.

W. T. SHERMAN,
General.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 188.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

TRANSMITTING,

In response to Senate resolution of June 23, 1882, *certified copies of all the oaths which were taken by the directors of the national banks in Richmond, Va., which were on file in the Comptroller's Office during the years* 1879 *and* 1880.

JUNE 28, 1882.—Orderd to lie on the table and to be printed.

TREASURY DEPARTMENT,
June 28, 1882.

SIR: I have the honor to acknowledge the receipt of Senate resolution, dated June 23, 1882, as follows:

Whereas it is alleged that the directors of some of the national banking associations in Richmond, Va., have been permitted to file in the office of the Comptroller of the Currency a modified oath with substantially the following proviso: "The above is subscribed in all respects except so far as it applies to the rate of interest allowed by law in this State": Therefore,

Resolved, That the Secretary of the Treasury be. and he is hereby, directed to send to the Senate as soon as practicable certified copies of all the oaths which were taken by the directors of the national banks in Richmond, Va., which were on file in the Comptroller's Office during the years 1879 and 1880.

In reply I send you herewith certified copies of the oaths of directors called for; also report in the matter, dated 26th instant, with its inclosures, from the Comptroller of the Currency, to whom the resolution had been referred.

Very respectfully,

CHAS. J. FOLGER,
Secretary.

Hon. DAVID DAVIS,
President of the United States Senate, pro tempore.

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, June 26, 1882.

SIR: I have the honor to acknowledge receipt to-day, by reference from your office, of a resolution of the Senate of the United States directing the Secretary of the Treasury, as soon as practicable, to send to the Senate—

Certified copies of all the oaths which were taken by the directors of the national banks in Richmond, Va., which were on file in the Comptroller's Office during the years 1879 and 1880.

In compliance with this resolution, I transmit herewith certified copies of all the directors' oaths now on file in this office which were received prior to January 1, 1881.

The Farmers' National Bank of Richmond went into liquidation on October 21, 1866, and the National Exchange Bank of Richmond on December 5, 1867. There are now four national banks in the city of Richmond, Va., and it seems that two of these banks, previous to the year 1881, filed oaths of directors in a modified form.

The rule of this office is to transmit to all national banks printed forms of oaths as required by section 5147 of the Revised Statutes; which banks are directed to return to this office these oaths, duly executed, immediately after the annual meeting held on such day in January of each year as is specified in the articles of association of each bank, which oaths are filed in this office.

Some time during the year 1881 the Comptroller was first informed by the clerk in charge of these files that the oaths of directors of two banks in the city of Richmond had been received and filed in a modified form.

The National Bank of Virginia was informed by letters from this office on February 17, May 23, and August 20, of that year, that such oaths could not be received, and this bank subsequently filed the regular form of oath as required by law.

Letters were also written to the Merchants' National Bank on March 30, July 16, August 12, and August 17, to the same purport, but no oaths were filed by this bank until the 20th instant, when the oaths of six directors of the bank were transmitted in a letter of that bank, of June 20, in which it was stated that the oaths of other directors would be forwarded as soon as they could be procured, a blank form having been forwarded to those whose residence was elsewhere than in that city.

Upon being informed that the oaths of these two Richmond banks had been filed in modified form, directions were given to carefully examine all oaths which should be received hereafter, and this has been carefully done, and it is confidently believed that all of the oaths of directors of banks in operation now on file in this office for the current year, with a single exception, are in the form required by statute.

The national banks generally transmit the oaths of directors promptly, as required by law, in the month of January of each year. There are, however, always some banks which neglect to forward promptly such oaths; and the Comptroller has great difficulty in compelling such banks to conform to the law.

Section 5213 of the Revised Statutes provides that every association which fails to make and transmit reports to the Comptroller as required by law shall be subject to a penalty of $100 for each day's delay in transmitting such reports; and the amount of such penalty is authorized to be retained by the Treasurer, upon the order of the Comptroller, out of the interest, as it may become due to any delinquent association, on the bonds deposited to secure circulation.

The Comptroller respectfully suggests that the passage of a similar provision imposing a penalty upon all national banks which shall delay forwarding the oaths of directors more than ten days after the annual election of directors would have the effect to prevent any future violations of law in this respect.

The resolution of the Senate is herewith returned, and copies of all the letters referred to in this communication are also inclosed.

Very respectfully,

JNO. JAY KNOX,
Comptroller.

Hon. CHARLES J. FOLGER,
Secretary of the Treasury.

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, February 17, 1881.

SIR: I return herewith the oath of directors, with the request that you substitute the inclosed blank without change or interlineation thereof.

This form has been carefully prepared in strict conformity to law, and cannot therefore be changed.

Very respectfully,

J. S. LANGWORTHY,
Deputy Comptroller.

CASHIER NATIONAL BANK OF VIRGINIA,
Richmond, Va.

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, May 23, 1881.

SIR: I return herewith the oath of seven directors of your bank.

The interlineation is observed, whereby exception is taken to one of the provisions of the Revised Statutes under which your bank was organized. The law relative to rate of interest is plain and cannot be changed by such exception; I therefore return herewith the oath and request that the directors subscribe to the form inclosed unchanged, which has been carefully prepared in accordance with the provisions of the national bank act.

Please send the full number (thirteen) required by your articles of association.

Very respectfully,

JNO. JAY KNOX,
Comptroller.

CASHIER NATIONAL BANK OF VIRGINIA,
Richmond, Va.

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, August 20, 1881.

SIR: Referring to office letter of May 23, when the oath of seven directors for the current year was returned to you for correction, I have to say nothing has been heard from you relative to the subject-matter since.

I have to request that you forward the oath of directors (thirteen in number) for the current year at once, as requested in office letter referred to. If this is not done within thirty days it will be necessary to send an examiner to ascertain the cause of this continued violation of law.

Let me hear from you at once.

Very respectfully,

J. S. LANGWORTHY,
Acting Comptroller.

CASHIER NATIONAL BANK OF VIRGINIA,
Richmond, Va.

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, August 24, 1881.

SIR: Your letter of the 22d instant is received, with oath of directors, which has been placed on file to await the return of the Comptroller, to whom the whole matter will be referred.

Very respectfully,

J. S. LANGWORTHY,
Acting Comptroller.

J. W. LOCKWOOD,
Cashier National Bank of Virginia, Richmond, Va.

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, March 30, 1881.

SIR: I return herewith the oath of directors of your bank elected for the current year.

The additional clause written thereon relative to the rate of interest cannot be approved. The law upon this subject is plain, and the form of oath has been carefully prepared in strict accordance with its provisions, and must be subscribed to without change. I inclose herewith blanks, which you will please have signed and duly executed by the directors, and return the same to this office without unnecessary delay.

Very respectfully,

J. S. LANGWORTHY,
Deputy Comptroller.

CASHIER MERCHANTS' NATIONAL BANK,
Richmond, Va.

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, July 16, 1881.

SIR: Referring to your letter of May 31 last, in which you acknowledged the receipt of the several communications from this office relative to the non-receipt of oath of directors for the current year, and assuring me that definite action would be taken in a few days, since which nothing has been heard from you relative to this matter, I now have to request that the oath of directors for the current year required by law to be forwarded to this office without further delay.

Let me hear from you at once.

Very respectfully,

JNO. JAY KNOX,
Comptroller.

J. B. MORTON,
Cashier Merchants' National Bank, Richmond, Va.

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, August 12, 1881.

SIR: Referring to your letter of July 22, in which you state that "the president and directors, who were then absent, were expected to return the next week, when the matter relative to oath of directors would receive immediate attention," will say, as this matter has been delayed quite too long, I have to request that it be attended to at once and the oath of directors for the current year be forwarded to this office without further delay.

Please let me hear from you upon receipt of this letter.

Very respectfully,

J. S. LANGWORTHY,
Acting Comptroller.

J. S. GLENN,
Cashier Merchants' National Bank, Richmond, Va.

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, August 17, 1881.

SIR: Referring to several communications written to your bank relative to the neglect to forward to this office oaths of directors, which were due in January last, and particularly to your letter of the 15th instant, stating that as soon as you could get a quorum of your directors together the matter would have attention, I would say that I can scarce see the necessity of having a quorum of directors present in order to have them qualify. If any of your directors decline to take the regular oath, printed copies of which have been forwarded to you, I would suggest that you reduce the number of directors and forward oaths of those that can qualify. It is absolutely necessary that this office should be in possession of the oaths of directors of your bank, and the delay has been so great now that unless some arrangement is made at once to

supply this deficiency, it will be necessary to send a special examiner to your bank to ascertain the reason of this neglect. Please let me hear from you at once upon the subject.

Very respectfully,

J. S. LANGWORTHY,
Acting Comptroller.

JNO. P. BRANCH, Esq.,
President Merchants' National Bank, Richmond, Va.

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of The National Bank of Virginia of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized, except as to the present law of this State with regard to the rate of discount; and that each of us is the *bona fide* owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

MARK DEWEY,	Jan'y	9, '77.
E. O. NOLTING,	"	9, '77.
WM. K. WATTS,	"	9, '77.
JAMES T. GRAY,	"	9, '77.
H. K. ELLYSON,	"	9, '77.
JOHN F. ALLEN,	"	9, '77.
CLAIBORNE WATKINS,	"	9, '77.
LUCIEN B. TATUM,	"	9, '77.
T. WM. PEMBERTON,	Jan'y	10, '77.
THOS. C. WILLIAMS,	"	10, '77.
JAMES W. ALLISON, JR.,	"	16, '77.
THOS. W. McGANCE,	"	16, '77.
WM. H. PALMER,	"	29, '77.

Subscribed and sworn to —— day of 9, 1877, before the undersigned ——, of said county.

Subscribed and sworn to on the dates opposite their names before the undersigned, a notary public for the city aforesaid.

[SEAL OF NOTARY.] J. M. MURRAY, *N. P.*

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The National Bank of Virginia, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized, except as to the present law of this State with regard to the rate of discount; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

E. O. NOLTING.
H. K. ELLYSON.
THOS. W. McCANCE.
JAMES W. ALLISON, JR.
JOHN F. ALLEN.
T. WM. PEMBERTON.
WM. H. PALMER.
CLAIBORNE WATKINS.
JAMES T. GRAY.
THOS. WILLIAMS.

Subscribed and sworn to this eleventh day of January, 1876, before the undersigned, a notary public of said county.

J. M. MURRAY, *Not. Pub.*

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of The National Bank of Virginia, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; except as to the present law of this State with regard to the rate of discount; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

L. B. TATUM.
WM. K. WATTS.
E. A. SAUNDERS.

Subscribed and sworn to this 22d day of January, 1876, before the undersigned, a notary public of said city.

J. M. MURRAY, *Not. Pub.*

[Office of Comptroller of the Currency. Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The National Bank of Virginia of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized, except as to the present law of this State with regard to the rate of discount; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

E. C. NOLTING.
WM. H. PALMER.
JAMES W. ALLISON.
JOHN T. ALLEN.
H. K. ELLYSON.
WM. K. WATTS.
JAMES T. GRAY.
H. B. TANNER.
THOS. W. McCANCE.
T. WM. PEMBERTON.
O. H. CHALKLY.
E. A. SAUNDERS.
CLAIBORNE WATKINS.

Subscribed and sworn to this 12th day of January, 1875, before the undersigned, a notary public of said city.

FRANK D. HILL, *N. P.*

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the Planters' National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the

provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

J. B. DAVIS.
W. B. ELVIN.
CHARLES E. WHITLOCK.
N. M WILSON.
JNO. K. CHILDREY.
J. B. PACE.
L. CHRISTIAN.
S. M. ROSENBAUM.
GEO. S. PALMER.

Subscribed and sworn to this 13th day of January, 1874, before the undersigned, a notary public of said city.

WM. SINTON,
Notary Public.

[Office of Comptroller of the Currency. Form No. 4.]

Oath of director.

STATE OF VIRGINIA,
City of Richmond, ss:

I, the undersigned, director of the Planters' National Bank of the city of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

W. W. GORDEN.

Subscribed and sworn to this 22d day of May, 1877, before the undersigned, a notary public of said county.

[SEAL OF NOTARY.] WM. SINTON, *N. P.*

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, national bank act.)

[Office of Comptroller of the Currency. Form No. 4.]

Oath of director.

STATE OF VIRGINIA,
City of Richmond, ss:

I, the undersigned, director of the Planters' National Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of ———, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

J. B. DAVIS.
J. A. BELVIN.
L. M. ROSENBAUM.
JNO. K. CHILDREY.
W. W. GORDEN.
CHARLES PHILIPS.
A. M. LYON.

Subscribed and sworn to this 8th day of Jan'y, 1878, before the undersigned, a ——— ——— of said county.

WM. SINTON, *N. P.*

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, national bank act.)

[Office of Comptroller of the Currency. Form No. 3.]

Oath of directors.

KINGDOM OF ITALY,
City of Rome, ss:

We, the undersigned, directors of the Planters National Bank, of Richmond, of the State of Virginia, United States of America, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia aforesaid, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and the same is not hypothecated or in any way pledged as security for any loan or debt.

W. M. WILSON.

Subscribed and sworn to this 25th day of January, 1878, before the undersigned, consul-general of the United States of America, resident in the city of Rome and Kingdom of Italy.

[SEAL OF CONSUL.] CHAS. McMILLAN,
Consul-General of the United States for Italy.

Fee, 50 cents.

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, national bank act.)

[Office of Comptroller of the Currency. Form No. 4.]

Oath of director.

STATE OF VIRGINIA,
City of Richmond, ss:

I, the undersigned, director of the Planters National Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

E. D. CHRISTIAN.

Subscribed and sworn to this 10th day of January, 1878, before the undersigned, a notary public of said city.

WM. SINTON,
Notary Public.

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, national bank act.)

[Office of Comptroller of the Currency. Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, city of Richmond, ss:

We, the undersigned, director of the Planters National Bank, of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United

States, and residents of the State of ——, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

JOHN B. DAVIS.
L. M. ROSENBAUM.
CHARLES PHILIPS.
WALTER H. MARTIN.
E. D. CHRISTIAN.
JNO. K. CHILDREY.
W. W. GORDEN.
ALLEN M. LYON.
J. A. BELVIN.

Subscribed and sworn to this 13th day of Jan'y, 1880, before the undersigned, a notary public of said county.

[SEAL OF NOTARY.] WALKER M. HILL, *N. P.*

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, national bank act.

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the Merchants' National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt except in so far as we are required to conform to the usury laws of the State of Virginia.

Z. W. PICKRELL.
WM. J. LEAKE.
BRADLEY T. JOHNSON.

Subscribed and sworn to this 15th day of January, 1879, before the undersigned, a notary public of said city, by Z. W. Pickrell, and by W. J. Leake and Bradley T. Johnson on the 16th day of January, 1879.

J. F. GLENN, *N. P.*

Oath of director.

STATE OF VIRGINIA,
County of Roanoke, ss:

I, the undersigned, director of the Merchants National Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; except so far as the rate of interest charged is concerned, and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

G. B. BOARD.

Subscribed and sworn to this 2d day of January, 1880, before the undersigned, a notary public of said county.

W. M. BARNETT.

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of The Merchants National Bank, of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt. The above is subscribed to except in so far as it restricts the bank to the rate of interest prescribed by law in this State.

WM. H. GARNETT.
JOHN P. BRANCH.
BRADLEY T. JOHNSON.

Subscribed and sworn to this fifth day of April, 1877, before the undersigned, a notary public of said city, by Wm. H. Garnett & by John P. Branch, and on the 9th day of April, 1877, by Bradley T. Johnson.

[SEAL OF NOTARY.] J. F. GLENN, *N. P.*

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of The Merchants' National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt, except in so far as we are required by law to conform to the rate of interest and the usury laws of the State of Virginia.

THOS. BRANCH.
FRED. R. SCOTT.
WM. H. GARNETT.
THOMAS POTTS.
R. C. MORTON.
WM. E. DIBRELL.
A. S. BUFORD.
JOHN P. BRANCH.
G. B. BOARD.
W. J. JOHNSON.

Subscribed and sworn to this 14th day of January, 1877, before the undersigned, a notary public of said city.

J. F. GLENN, *N. P.*

Oath of director.

STATE OF VIRGINIA,
City of Richmond, ss:

I, the undersigned, director of The Merchants' Nat'l Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that I am the bona-fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

The above is subscribed to in all respects, except in so far as prescribed by law in this State.

JAMES H. DOOLEY.

Subscribed and sworn to this 14th day of Feb'y, 1880, before the undersigned, a notary public of said city.

J. F. GLENN, *N. P.*

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The Merchants' Nat'l Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona-fide owner in his own right of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt. The above is subscribed to in all respects except in so far as it restricts this bank to the rate of interest allowed by law in this State.

THOS. BRANCH.
THOMAS POTTS.
JOHN P. BRANCH.
R. C. MORTON.
A. S. BUFORD.
FRED. R. SCOTT.
W. I. JOHNSON.
WM. E. DIBRELL.
WM. J. LEAKE.
WM. H. GARNETT.
Z. W. PICKRELL.

Subscribed and sworn to this 13th day of Jan'y, 1880, before the undersigned, a notary public of said county.

J. F. GLENN, *N. P.*

Subscribed and sworn to this 14th day of January, 1880, before me.

J. F. GLENN, *N. P.*

Oath of director.

STATE OF VIRGINIA,
County of Henrico, city of Richmond, ss:

I, the undersigned, director of the National Bank of Virginia of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized, except as to present law of this State with regard to the rate of discount; and that I am the bona-fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

THOS. C. WILLIAMS.

Subscribed and sworn to this 1st day of May, 1880, before the undersigned, a notary public of said city.

[SEAL.] J. M. MURRAY, *Not. Pub.*

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of The National Bank Virginia, of the city of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally,

so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized, except as to the present law of this State with regard to the rate of discount; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

HERBERT A. CLAIBORNE.
MARK DRURY.
THOS. W. McCANCE.
JAMES W. ALLISON, Jr.
JAMES T. GRAY.
CLAIBORNE WATKINS.
WM. K. WATTS.
JOHN F. ALLEN.
O. F. WEISIGER.
E. O. NOLTING.

Subscribed and sworn to this 13th day of January, 1880, before the undersigned, a notary public of said city.

J. M. MURRAY, *Not. Pub.*

Oath of director.

STATE OF VIRGINIA,
City of Richmond, County of Henrico, ss:

We, the undersigned, directors of The National Bank of Virginia, of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of ———, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized, except as to the present law of this State with regard to the rate of discount; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

WM. H. PALMER.
L. B. TATUM.

Subscribed and sworn to this 16th day of February, 1880, before the undersigned, a notary public of said city.

J. M. MURRAY, *Not. Pub.*

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the National Bank of Virginia, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized, except as to the present law of this State with regard to the rate of discount; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

WM. H. PALMER,	Jan. 18, 1879.
JAMES T. GRAY,	Jan. 18, "
CLAIBORNE WATKINS,	" 14, "
THOS. W. McCANCE,	" 16, "
E. O. NOLTING,	" 14, "
JOHN W. ALLISON, Jr.,	" 14, "
MARK DRURY,	" 14, "
JOHN F. ALLEN,	" 14, "
H. A. CLAIBORNE,	" 14, "
WM. K. WATTS,	" 14, "
H. R. ELLYSON,	" 14, "

Subscribed and sworn to this —— days of January, 1879, opposite their names, before the undersigned, a notary public of said city.

J. M. MURRAY, *Not. Pub.*

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of The National Bank of Virginia, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank, and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized, except as to the present law of this State with regard to the rate of discount; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

L. B. TATUM, 17 Febr'y, 1879.
THOS. C. WILLIAMS, 28 Febr'y, 1879.

Subscribed and sworn to —— day of February, 1879, after their names, before the undersigned, a notary public of said city.

J. M. MURRAY, *Not. Pub.*

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The National Bank of Virginia, of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank, and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized, except as to the present law of this State with regard to the rate of discount; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

E. O. NOLTING.
JAMES T. GRAY.
WM. H. PALMER.
WM. K. WATTS.
THS. C. WILLIAMS.
MARK DRURY.
JOHN F. ALLEN.

Subscribed and sworn to this eighth day of January, 1878, before the undersigned, a notary public of said county.

J. M. MURRAY, *Not. Pub.*

[Office of Comptroller of the Currency. Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of The Merchants Nat' Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothe-

cated, or in any way pledged as security for any loan or debt, except in so far as this affidavit restricts us to the rate of interest prescribed by law.

W. J. JOHNSON.
THOMAS POTTS.
R. C. MORTON.
WM. E. DIBRELL.
THOS. BRANCH.
FRED. R. SCOTT.
WM. J. LEAKE.
Z. W. PICKRELL.

Subscribed and sworn to this 10th day of Jan'y, 1877, before the undersigned, a notary public of said county.

J. F. GLENN, *N. P.*

Subscribed and sworn to before me by W. J. Leake this 11th day of Jan'y, 1877.
[SEAL OF NOTARY.] J. F. GLENN, *N. P.*

Subscribed and sworn to before me by Z. W. Pickrell this 13th day of Jan y, 1877.
[SEAL OF NOTARY.] J. F. GLENN, *N. P.*

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of The Merchants National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt, except in so far as this affidavit restricts us to the rate of interest prescribed by law.

W. J. JOHNSON.
THOMAS POTTS.
R. C. MORTON.
WM. E. DIBRELL.
THOS. BRANCH.
FRED. R. SCOTT.
WM. J. LEAKE.
Z. W. PICKRELL.

Subscribed and sworn to this 10th day of Jan'y, 1877, before the undersigned, a notary public of said county.

J. F. GLENN, *N. P.*

Subscribed and sworn to before me by W. J. Leake this 10th day of Jan'y, 1877.
[SEAL OF NOTARY.] J. F. GLENN, *N. P.*

Subscribed and sworn to before me by Z. W. Pickrell this 13th day of Jan'y, 1877.
[SEAL OF NOTARY.] J. F. GLENN, *N. P.*

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The National Bank of Virginia, of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized, except as to the present law of this State with regard to the rate of discount; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his own name on the books of the

said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

H. K. ELLYSON,	Jan'y 10, 1878.
THOS. W. McCANCE,	Jan'y 10, "
CLAIBORNE WATKINS,	Jan'y 10, "
JAMES W. ALLISON, JR.,	Jan'y 15, "
T. WM. PEMBERTON,	Jan'y 15, "
L. B. TATUM,	Jan'y 15, "

Subscribed and sworn to this —— day of ——, 18—, before the undersigned, a —— —— of said county.

Subscribed and sworn to on the dates following their names before the undersigned, a notary public for the said county.

J. M. MURRAY, *Not. Pub.*

TREASURY DEPARTMENT,
OFFICE OF COMPTROLLER OF THE CURRENCY,
Washington, June 27, 1882.

I certify that the papers to which this is attached have been carefully compared with the originals, and that the same are true and complete copies of the original oaths of directors of the national banks of Richmond, Va., which were transmitted to this office previous to January 1, 1881, as appears from the files of this office.

In testimony whereof I have hereto subscribed my name and caused my seal of office to be affixed to these presents, at the city of Washington, this 27th day of June, A. D. 1882.

JNO. JAY KNOX,
Comptroller of the Currency.

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The National Exchange Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act, and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

A. VANCE BROWN.
RODNEY B. SMITH.
SAMUEL R. ADAMS.
WILLIAM B. JONES.
J. DAVENPORT.
WILLIAM BEERS.
SAM'L. C. ROBINSON.

Subscribed and sworn to this eighth day of May, 1865, before the undersigned, a notary public in and for the city of Richmond, Va.

[SEAL.]

FRANCIS J. SMITH,
Notary Public.

[5 ct. rev. stamp cancelled.]

Oath of director.

DISTRICT OF COLUMBIA,
County of Washington, ss:

I, the undersigned, director of the National Exchange Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States and resident of the State of Maryland, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the —— under which this bank has been organized; and that I am the bona-fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name

on the books of the said bank, and required by said ——; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

OSCAR KING.

Subscribed and sworn to this 4th day of May, 1865, before the undersigned, a justice of the peace of said county.

CH'S P. WANNALL, *J. P.*

[5 ct. rev. stamp cancelled.]

Oath of director.

DISTRICT OF COLUMBIA,
County of Washington, ss:

I, the undersigned, director of the National Exchange Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that I am the bona-fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

HIRAM M. RANNEY.

Subscribed and sworn to this 12th day of May, 1865, before the undersigned, a justice of the peace of said county.

CH'S P. WANNALL, *J. P.*

[5 ct. rev. stamp cancelled.]

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of The National Exchange Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

A. VANCE BROWN.
J. B. PACE.
I. DAVENPORT, JR.
W. B. JONES.
JOHN PURCELL.
M. ROSENBAUM.
WM. BEERS.

Subscribed and sworn to this 17th day of November, 1866, before the undersigned, a notary public of said city.

BENJ. B. WEISIGER,
Notary Public.

[5 c. stamp.]

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of The National Exchange Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said ba .k; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and

required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

WM. BEERS.
I. DAVENPORT, JR.
W. B. JONES.
J. B. PACE.
A. VANCE BROWN.
JOHN PURCELL.
H. M. RANNEY.
M. ROSENBAUM.
F. R. PRICE,
By S. B. SWANHATTS.

Subscribed and sworn to this 23rd day of March, 1867, before the undersigned, a notary public of said city.

BENJ. B. WEISIGER,
Notary Public.

[5 c. stamp.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the Farmers' Nat'l Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia and New Jersey, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

JOHN W. HALL.
JOEL A. FITHIAN.
GEORGE W. GILLIANE.
NATH'L AUGUST.
HIRAM B. DICKERSON.

Subscribed and sworn to this 22d day of September before the undersigned, a notary public of said county.

J. B. MACMURDO,
Notary Public.

[5 ct. stamp, cancelled 22 Sept., 1865.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the Farmers Nat'l Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

N. AUGUST.
L. W. GRAZEBROOK.
J. L. APPERSON.
JOHN DOOLEY.
H. B. DICKENSON.
MASON LOEB.
GEO. W. WEST.
WALTER K. MARTIN.
JOEL A. FITHIAN.
HUGH W. FRY.

Subscribed and sworn to this 23d day of January, 1866, before the undersigned, a notary public of said county.

J. A. AUGUST, *Not. Pub.*

[2 ct. stamp, cancelled Jan. 23, 1866.]

[Office of Comptroller of the Currency. Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

T. DAVENPORT, JR.
M. L. FRANS.
CHARLES R. KINKER.
THOMAS W. DOSWELL.
W. HATCHER.
PRICH. T. BROWN.

Subscribed and sworn to this 13th day of January, 1880, before the undersigned, a notary public of said county.

W. T. ALLEN, *Notary Public.*

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, National Bank Act.)

[Office of Comptroller of the Currency. Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

H. Y. STOKES.
GEO. W. ALLEN.
G. B. DAVENPORT.
W. J. YARBROUGH.
H. D. WHITCOMB.
FRANKLIN STEARNS.
B. F. LADD.

Subscribed and sworn to this 13th day of January, 1880, before the undersigned, a notary public of said county.

WM. T. ALLEN, *Notary Public.*

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, National Bank Act.)

[Office of Comptroller of the Currency. Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

T. DAVENPORT.
M. L. FRANS.
CHARLES R. KINKER.
THOMAS W. DOSWELL.
A. Y. STOKES.
W. J. YARBROUGH.
WM. HATCHER.
B. F. LADD.
PRICH. T. BROWN.
FRANKLIN STEARNS.
GEO. W. ALLEN.

Subscribed and sworn to this 14th day of January, 1879, before the undersigned, a notary public of said county.

W. T. ALLEN, *Notary Public.*

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, National Bank Act.)

STATE OF VIRGINIA,
City of Richmond, ss:

I, the undersigned, director of the Merchants Nat'l Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that I am the bona-fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt. The foregoing subscribed to, except in so far as it may restrict the bank to the rate of interest prescribed by law in this State.

A. S. BUFORD.

Subscribed and sworn to this 9th day of June, 1877, before the undersigned, a notary public of said city.

[SEAL OF NOTARY.] J. F. GLENN, *N. P.*

STATE OF VIRGINIA,
County of Roanoke, ss:

I, the undersigned, director of the Merchants National Bank of Richmond, of the the State of Virginia, do solemnly swear that I am a citizen of the United States and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that I am the bona-fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt, with the exception that I do not restrict myself to the rate of interest prescribed by law of the State of Virginia.

G. B. BOARD.

Subscribed and sworn to this 12th day of January, 1878, before the undersigned, a notary public of said county.

WM. M. BARNET, *Notary Public.*

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the Merchants' National Bank of Richmond, or the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt, with the exception that we do not restrict ourselves to the rate of interest prescribed by law of the State of Va.

JOHN P. BRANCH.
R. C. MORTON.
W. E. DIBRELL.
W. H. GARNETT.
WM. J. LEAKE.
THOS. BRANCH.
FRED. R. SCOTT.
THOMAS POTTS.
Z. W. PICKRELL.
A. S. BUFORD.
W. I. JOHNSON.
BRADLEY T. JOHNSON.

Subscribed and sworn to this eighth day of January, 1878, before the undersigned, a notary public of said city, by John P. Branch, R. C. Morton, W. E. Dibrell, W. H. Garnett, W. J. Leake, Thomas Branch, Fred. R. Scott, Thomas Potts, and A. S. Buford.

J. F. GLENN, *N. P.*

Subscribed and sworn to this 9th day of Jan'y, 1878, before me, a notary public for said city and State, by Z. W. Pickrell & W. J. Johnson.

J. F. GLENN, *N. P.*

Subscribed and sworn to before me this 18th day of Jan'y, 1878, by Bradley T. Johnson.

J. F. GLENN, *N. P.*

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State Virginia, do solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that we are the bona fide owners, in our own right, of the number of shares of stock subscribed by us or standing in our names on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

T. DAVENPORT, JR.
A. Y. STOKES.
AMBROSE CARLTON.
M. L. FRAUS.
W. J. YARBROUGH.
RICH. Q. BROWN.
THOMAS W. DOSWELL.
W. HATCHER.
FRANKLIN STEARNS.

Subscribed and sworn to this 11th day of January, 1876, before the undersigned, a notary public of said county.

WM. T. ALLEN, *Notary Public.*

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State Virginia, and that we will, severally, as far as

the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

T. DAVENPORT, JR.
AMBROSE CARLTON.
M. L. FRAUS.
THOS. W. DOSWELL.
W. HATCHER.
W. J. YARBROUGH.
A. Y. STOKES.
RICH. Q. BROWN.
FRANKLIN STEARNS.

Subscribed and sworn to this —— day of ——, 1875, before the undersigned, a notary public of said county.

WM. T. ALLEN, *Notary Public.*

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves upon us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

T. DAVENPORT, JR.
AMBROSE CARLTON.
FRANKLIN STEARNS.
JOHN PURCELL.
M. L. KRAUS.
THOMAS W. DOSWELL.
RICH. Q. BROWN.
W. HATCHER.
W. J. YARBROUGH.

Subscribed and sworn to this 14th day of January, 1874, before the undersigned, a notary public of said county.

WM. F. ALLEN, *Notary Public.*

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank, and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

M. L. FRAUS.
FRANKLIN STEARNS.
JOHN PURCELL.
T. DAVENPORT.
S. C. TARDY.
DAVID J. SAUNDERS.
W. HATCHER.
RICH. T. BROWN.
AMBROSE CARLTON.
W. J. YARBROUGH.

Subscribed and sworn to this fifteenth day of January, 1873, before the undersigned, a notary public of said county.

W. T. ALLEN, *N. P.*

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Vi'g'a, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

T. DAVENPORT, JR.
J. H. BLAIR.
RICH. T. BROWN.
W. HATCHER.
M. L. FRAUS.
JOHN PURCELL.
DAVID J. SAUNDERS.
W. J. YARBURGH.
S. C. TARDY.

Subscribed and sworn to this tenth day of January, 1872, before the undersigned, a notary public of said county.

WM. T. ALLEN, *Notary Public.*

STATE OF VIRGINIA,
City of Richmond, ss:

We the undersigned directors of The First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

J. DAVENPORT.
S. C. TARDY.
M. L. FRAUS.
W. HATCHER.
PRICH. Y. BROWN.
DAVID J. SAUNDERS.
J. H. BLAIR.
JOHN PURCELL.
FRANKLIN STEARNS.

Subscribed and sworn to this eleventh day of January, 1871, before the undersigned, a notary public of said city.

J. M. MURRAY, *Not. Pub.*

STATE OF VIRGINIA,
City of Richmond, ss:

We the undersigned, directors of The First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said

act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

J. DAVENPORT.
FRANKLIN STEARNS.
JNO. E. WHITE.
DAVID J. SAUNDERS.
J. H. BLAIR.
WM. BEERS.
JOHN PURCELL.
PRICH. L. BROWN.
S. C. TARDY.
M. ROSENBAUM.
A. Y. STOKES.

Subscribed and sworn to this twelfth day of January, 1870, before the undersigned, a notary public of said county.

J. M. MURRAY, *N. P.*

STATE OF VIRGINIA,
City of Richmond, ss:

We the undersigned directors of The First Nat. Bk. Richmond, State of Virginia, do solemnly swear that we are citizens of the United States, and residents of the State of Vriginia, and that we will, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that we are the bona fide owners, in our own right, of the number of shares of stock subscribed by us or standing in our names on the books of the said bank, and required by said act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

FRANKLIN STEARNS.
ABDNER BROWN.
S. C. TARDY.
DAVID J. SAUNDERS.
JOHN PURCELL.
T. DAVENPORT, JR.
PRICH. L. BROWN.
A. Y. STOKES.
M. RASUNBAUM.
WM. BEERS.
JNO. E. WHITE.

Subscribed and sworn to this twelfth day of January, 1869, before the undersigned, a notary public of said city.

J. M. MURRAY, *N. P.*

STATE OF VIRGINIA,
County of Henrico, City of Richmond, ss:

We the undersigned directors of The First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

ABDNER BROWN.
A. Y. STOKES.
S. C. TARDY.
DAVID J. SAUNDERS.
JOHN PURCELL.
JNO. E. WHITE.
FRANKLIN STEARNS.
THOS. R. PRICE.
T. DAVENPORT, JR.
HAMILTON G. FANT.
RICH'D L. BROWN.
J. M. ROSENBAUM.
WM. BEERS.

Subscribed and sworn to this 14th day of Jan'y, before the undersigned, a notary public of said county and city.

J. M. MURRAY, *Not. Pub.*

STATE OF VIRGINIA,
City of Richmond, County of Henrico, ss:

We the undersigned directors of The First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

DAVID J. SAUNDERS.
JNO. E. WHITE.
AMBROSE CARLTON.
JNO. K. CHILDREY.
FRANKLIN STEARNS.
DAVID M. SON.
H. G. FANT.
S. C. PARDY.
WM. TAYLOR.
A. Y. STOKES.
D'L VON GRONVING.

Snbscribed and sworn to this tenth day of January, 1867, before the undersigned, a notary public of said county.

J. M. MURRAY, *N. P.*

[5-ct. stamp, canceled.]

STATE OF VIRGINIA,
County of Henrico, ss:

We the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

S. C. TARDY.
FRANKLIN STEARNS.

Subscribed and sworn to this 13th day of January, 1866, before the undersigned, a notary public of said county.

J. M. MURRAY, *Not. Pub.*

[5-ct. stamp, canceled.]

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said

act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

DANIEL VON GRONING.
JOSEPH R. ANDERSON.
DAVID J. SAUNDERS.
JNO. K. CHILDREY.
A. Y. STOKES.
PHILIP HAXALL.
JNO. E. WHITE.
HORACE L. KENT.
WM. TAYLOR.
W. GODDEN.
H. G. FANT.

Subscribed and sworn to this twelfth day of January, 1866, before the undersigned, a notary public of said county.

J. M. MURRAY, *Notary Public.*

[5-ct. stamp, cancelled.]

DIST. OF COL.,
County of Washington, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

WM. L. HODGE.
HAMILTON G. FANT.
CHAS. P. SHAW.

Subscribed and sworn to this 25th day of April, before the undersigned notary public of said county.

[5-cts. stamp, cancelled.]

STATE OF VIRGINIA,
County of Alexandria, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

LEWIS M. STENZIE.
SAMUEL BAKER.
JOHN LANMAN.
JOB H. GRAY.
HENRY McWILLIAMS.

Subscribed and sworn to this twenty-fourth day of April, 1865, before the undersigned, notary public of said county. Witness my hand and official seal.

T. A. STOUTENBURGH,
Notary Public.

[5 cts. stamp.]

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the Merchants' National Bank of Richmond, of the State of Virginia, do solemnly swear that we are citizens of the United States and

residents of the State of Virginia, and that we will, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that we are the bona fide owners, in our own right, of the number of shares of stock subscribed by us or standing in our names on the books of said bank, and required by said act, and the same are not hypothecated, or in any way pledged as security for any loan or debt.

THOS. BRANCH.
A. Y. STOKES.
RICHARD IRBY.
BRADLEY T. JOHNSON.
W. H. PALMER.
JOHN LIDUS.
CHAS. S. TODD.
EDWD. GRAHAM.
W. C. KNIGHT.
ARCHER ANDERSON.
JNO. A. SLOAN.

Subscribed and sworn to this eleventh day of January, 1871, before the undersigned, a notary public of said county.

J. F. GLENN, *N. P.*

[5-ct. stamp, cancelled 11 Jan'y, 1871.]

STATE OF VIRGINIA,
County of Henrico, ss:

I, the undersigned, director of the Merchants' National Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said act; and the same is not hypothecated, or in any way pledged as security for any loan or debt.

FRED. R. SCOTT.

Subscribed and sworn to this 10th day of Febr'y, 1871, before the undersigned, a notary public of said county.

[SEAL OF NOTARY.] J. F. GLENN.

[5-ct. stamp, cancelled.]

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the Merchants' National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

THOS. BRANCH.
A. Y. STOKES.
FRED. R. SCOTT.
RICHARD IRBY.
W. C. KNIGHT.
T. WM. PEMBERTON.
WM. JOSIAH LEAKE.
EDWD. GRAHAM.
BRADLEY T. JOHNSON.
ARCHER ANDERSON.
Z. W. PICKRELL.
CHAS. L. TODD.

Subscribed and sworn to this 9th day of Jan'y, 1872, before the undersigned, a notary public of said county.

[NOTARY SEAL.] J. F. GLENN, *N. P.*

Subscribed & sworn to this 10th day of Jan'y, 1872, as to Archer Anderson, before me, a notary public of said county.

J. F. GLENN, *N. P.*

Subscribed & sworn to this 10th day of Jan'y, 1872, as to Z. W. Pickrell & Chas. L. Todd, before me, a notary public of said county.

J. F. GLENN.

STATE OF VIRGINIA,
City of Richmond, ss:

I, the undersigned, director of the Merchants' Nat'l Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

A. S. BUFORD.

Subscribed and sworn to this 6th day of April, 1872, before the undersigned, a notary public of said city.

J. F. GLENN, *N. P.*

STATE OF VIRGINIA,
City of Richmond, ss:

I, the undersigned, director of the Merchants' Nat'l Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me, or standing in my name on the books of the said bank, and required by said act; and the same is not hypothecated or in any way pledged as security for any loan or debt.

EDW. GRAHAM.

Subscribed and sworn to this 17th day of Jan'y, 1873, before the undersigned, a notary public of said city.

J. F. GLENN, *N. P.*

STATE OF VIRGINIA,
City of Richmond, ss:

I, the undersigned, director of the Merchants' Nat'l Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank, and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said act; and that the same is not hypothecated or in way pledged as security for any loan or debt.

ARCHER ANDERSON.

Subscribed and sworn to this 15th day of January, 1873, before the undersigned, a notary public of said city.

J. F. GLENN, *N. P.*

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the Merchants' Nat'l Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the

provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

Z. W. PICKRELL.
THOS. BRANCH.
CHAS. L. TODD.
A. Y. STOKES.
RICHARD IRBY.
FRED. R. SCOTT.
W. I. JOHNSON.

Subscribed and sworn this 17th day of January, 1873, before the undersigned, a notary public of said city.

J. F. GLENN, *N. P.*

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the Merchants' Nat'l Bank of Richmond, of the State of Virginia, do solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that we are the bona fide owners, in our own right, of the number of shares of stock subscribed by us or standing in our names on the books of the said bank, and required by said act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

BRADLEY T. JOHNSON.
WM. JOSIAH LEAKE.

Subscribed and sworn to this 23d day of Jan'y, 1873, before me, the undersigned, a notary public of said city, as to B. T. Johnson, and 25th day of Jan'y, 1873, as to W. J. Leake.

J. F. GLENN, *N. P.*

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the Merchants' Nat'l Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and the same is not hypothecated or in any way pledged as security for any loan or debt.

ARCHER ANDERSON.
BRADLEY T JOHNSON.
CHAS. L. TODD.
W. I. JOHNSON.
Z. W. PICKRELL.
RICHARD IRBY.

Subscribed and sworn to this 14th day of Jan'y, 1874, before the undersigned, a notary public of said city.

J. F. GLENN, *N. P.*

[Office of Comptroller of the Currency. Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the Merchants' Nat'l Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the pro-

visions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

WM. JOSIAH LEAKE.
THO. BRANCH.
A. S. BUFORD.
FRED. R. SCOTT.

Subscribed and sworn to this 15th day of Jan'y, 1874, before the undersigned, a notary public of said county, as to W. J. Leake and Thomas Branch; on the 16th Jan'y, 1874, as to A. S. Buford; and on the 26th Jan'y, 1874, as to F. R. Scott.

J. F. GLENN, *N. P.*

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, national bank act.)

STATE OF VIRGINIA,
City of Richmond, to wit:

I hereby certify that I am a citizen of the United States, and that I am now and have been a resident of the city aforesaid for one year next preceding my election as a director of the Merchants' National Bank of the city of Richmond; that so far as the duty devolves on me I will diligently and honestly administer the affairs of the Merchants' Nat'l Bank of Richmond; that I will not knowingly violate, or permit to be violated, any of the provisions of the act of Congress under which the aforesaid bank is organized; that I am the bona fide owner, in my own right, of the number of shares subscribed by me and standing in my name on the books of the bank aforesaid, and that the same is not hypothecated or in any way pledged as security for any loan or debt.

R. C. MERTON.

Sworn and subscribed to before me this —— day of July, 1874.

J. F. GLENN, *N. P.*

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the Merchants' National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

W. J. JOHNSON.
FRED. R. SCOTT.
WM. J. LEAKE.
CHAS. L. TODD.
RICHARD IRBY.
BRADLEY T. JOHNSON.
Z. W. PICKRELL.
R. C. MORTTON.
A. S. BUFORD.

Subscribed and sworn to this 12th day of Jan'y, 1875, before the undersigned, a notary public of said city, by W. J. Johnson, Fred. R. Scott, W. J. Leake, Chas. L. Todd, Richard Irby.

J. F. GLENN, *N. P.*

Subscribed and sworn to this 18th day of Jan'y, 1875, by Bradley T. Johnson, Z. W. Pickrell, & R. C. Mortton, before me.

J. F. GLENN, *N. P.*

STATE OF VIRGINIA,
County of Duval, ss:

I, the undersigned, director of the Merchants' National Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and res-

ident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of said bank, and required by said act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

G. B. BOARD.

Subscribed and sworn to this 27th day of January, 1875, before the undersigned, a notary public and justice of the peace of said county.

[SEAL OF NOTARY.] W. L. COAN, *Notary Public.*

STATE OF VIRGINIA,
City of Richmond, County of H——, ss:

We, the undersigned, directors of the Merchants' National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

THOS. BRANCH.
A. Y. STOKES.
BRADLEY T. JOHNSON.
RICHARD IRBY.
FRED R. SCOTT.

Subscribed and sworn to this 15th day of December, 1876, before the undersigned, a notary public of said city.

[SEAL OF NOTARY.] JOHN F. GLENN, *N. P.*

[5 ct. stamp, cancelled. T. B., 15, 12, '76.]

STATE OF VIRGINIA,
County of Roanoke, ss:

I, the undersigned, director of the Merchants' National Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

G. B. BOARD.

Subscribed and sworn to this 19th day of January, 1877, before the undersigned, a notary public of said county.

[SEAL OF NOTARY.] W. M. BARNITZ, *Notary Public.*

[Office of Comptroller of the Currency.—Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said

bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

FRANKLIN STEARNS.
I. DAVENPORT, JR.
A. CARLTON.
W. J. YARBROUGH.
RICH. T. BROWN.
M. L. FRANS.
THOMAS W. DOSWELL.
B. F. LADD.
W. HATCHER.
CHARLES R. KINKER.
GEO. W. ALLEN.

Subscribed and sworn to this 8th day of January, 1878, before the undersigned, a notary public of said county.

W. T. ALLEN, *Notary Public.*

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, national bank act.)

[Office of Comptroller of the Currency.—Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the First National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona-fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

I. DAVENPORT, JR.
A. Y. STOKES.
M. L. FRANS.
THOMAS W. DOSWELL.
I. H. BLAIR.
AMBROSE CARLTON.
W. J. YARBROUGH.
RICH. T. BROWN.
W. HATCHER.
FRANKLIN STEARNS.

Subscribed and sworn to this 9th day of January, 1877, before the undersigned, a notary public of said county.

W. T. ALLEN, *Notary Public.*

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, national bank act.)

[Office of Comptroller of the Currency.—Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the First National bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said

bank, and required by said Revised Statutes; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

B. F. LADD.
CHARLES R. KINKER.
GEO. W. ALLEN.

Subscribed and sworn to this ninth day of January, 1877, before the undersigned, a notary public of said county.

WM. T. ALLEN.
Notary Public.

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, national bank act.)

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the National Bank of Virginia, of Richmond, of the city of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia and New York, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated or in any way pledged as security for any loan or debt.

REBUEN RAYLAND.
CHARLES GALLAGHER.
JNO. M. LAMB.
JOHN B. MORTOX.
GEORGE W. GILLIAM.
DAVID CURRIE.
R. W. HUGHES.
SAMUEL T. SUIT, OF NEW YORK.
GEORGE T. MAY, OF N. Y.

Subscribed and sworn to this first day of May, 1865, before the undersigned, a notary public of said city.

WM. J. RIDDICK, *N. P.* [SEAL.]

[U. S. Inter. Revenue, 5. W. J. R., May 1, 1865.]

STATE OF VIRGINIA,
County of Henrico, ss:

We, theu ndersigned, directors of The National Bank of Virginia, of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank, and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

CHAS. J. WORTHAM.
DAVID CURRIE.
E. O. NOLTING.
JOHN P. BALLARD.
JAMES M. TALBOTT.
G. W. WILLIAMS.
M. BLAIR.

Subscribed and sworn to this eleventh day of January, 1866, before the undersigned, a notary public of said county.

[NOTARY SEAL.] J. B. MACMURDO, *Not. Pub.*

[J. B. M., N. P., Jan. 1866.]

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The National Bank of Virginia, of Richmond, of the State of Virginia, do solemly swear that we are citizens of the United States, and

residents of the State of Virginia, and that we will, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that we are the bona fide owners, in our own right, of the number of shares of stock subscribed by us or standing in our names on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

GEO. W. GILLIAM.
A. F. HARVEY.

Subscribed and sworn to this tenth day of Jan'y, 1866, before the undersigned, a notary public of said county.

[SEAL NOTARY.]

J. B. MACMURDO,
Notary Public.

[J. B. M., N. P., Jan. 10, 1866.]

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The National Bank of Virginia, of Richmond, State of Virginia, do solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will each of us severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which the bank has been organized; and that we are severally the bona fide owners, in our own right, of the number of shares of stock subscribed by us or standing in our name on the book of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

A. F. HARVEY.
M. BLAIR.
G. W. WILLIAMS.
E, O. NOLTING.
WALLER K. MARTIN.
GEO. W. GILLIAM.
V. W. GRUBBS.
WM. H. PALMER.
W. T. SUTHULIN.
CHAS. T. WORTHAM.
T. B. WILSON.
GARRET F. WATSON.
JAMES M. TALBOTT.

Subscribed and sworn to this ninth day of January, 1867, before the undersigned, a notary public of said county.

J. B. MACMURDO, *Notary Public.*

[J. B. M., N. P., 9 *Jan'y*, 1867.]

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The National Bank of Virginia, of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by *by* said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

CHAS. T. WORTHAM.
GEO. W. GILLIAM.
WM. K. WATTS.
M. BLAIR.
A. F. HARVEY.
O. H. CHALKLEY.
GARRET F. WATSON.
E. O. NOLTING.
T. B. WILSON.
WALTER K. MARTIN.
JAMES M. TALBOTT.
WM. H. PALMER.

Subscribed and sworn to this 15th day of Jan'y, 1868, before the undersigned, a notary public of said county.

O. S. MORTON, *N. P.*

[Stamp, cancelled, 5 cts.]

STATE OF VIRGINIA,
County of Henrico, ss:

I, the undersigned, director of The National Bank of Virginia, of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

THOS. W. McCAME.

Subscribed and sworn to this 17th day of January, 1868, before the undersigned, a notary public of said county.

O. S. MORTON, *N. P.*

[Stamp, Jan. 17, 1868, cancelled.]

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The National Bank of Virginia, of Richmond, of the State of Virginia, do solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

A. F. HARVEY.
THOS. W. McCAME.
WM. K. WATTS.
J. M. TALBOTT.
GARRET T. WATSON.
O. H. CHALKLEY.
J. B. WILSON.
WM. H. PALMER.
GEO. LEE.
WALTER K. MARTIN.
E. O. NOLTING.

Subscribed and sworn to this 14th day of January, 1869, before the undersigned, a notary public of said county.

O. S. MORTON, *N. P.*

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The National Bank of Virginia, of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which said bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

CHAS. T. WORTHAM.
THOS. C. WILLIAMS.

Subscribed and sworn to this 25th day of January, 1869, before the undersigned, a notary public of said county.

O. S. MORTON, *N. P.*

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the National Bank of Virginia, of Richmond, of the State of Virginia, do each of us solemnly swear or affirm that we are citizens of the United States and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him standing in his name on the books of said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

E. O. NOTLING.
CHAS. T. WORTHAM.
THOS. C. WILLIAMS.
THOS. W. McCANCE.
GEORGE LEE.
J. B. WILSON.
WM. H. PALMER.
J. W. ALLISON.
WM. K. WATTS.
PEYTON WISE.
O. W. CHALKLEY.
J. M. TALBOTT.

Subscribed and sworn to this twelfth and thirteenth days of January, 1870, before the undersigned, a notary public of said county.

[SEAL.] O. S. MORTON, *N. P.*

All the directors have qualified except A. F. Harvey, who is absent from the city.

STATE OF VIRGINIA,
County of Henrico, ss:

I, the undersigned, director of the National Bank of Virginia, of Richmond, of the State of Virginia, do solemnly affirm that I am a citizen of the United States, and resident of the State of Virginia, and that I will, as far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said act; and the same is not hypothecated, or in any way pledged as security for any loan or debt.

A. T. HARVEY.

Subscribed and affirmed to this 4th day of February, 1870, before the undersigned, a notary public of said county.

O. S. MORTON, *N. P.*

Mr. Harvey has been absent from the city since the day of election of directors until to-day.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the National Bank of Virginia of Richmond, Va., of the State of Virginia, do each solemly affirm that we are citizens of the United States and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

A. T. HARVEY,
J. M. TALBOTT,
E. O. NOLTING,
O. H. CHALKLEY,
THOS. W. McCANCE,
THOS. C. WILLIAMS,
GEO. LEE,
WM. K. WATTS.

Subscribed and affirmed to this 11th day of January, 1871, before the undersigned, a notary public of said county.

O. S. MORTON, *N. P.*

STATE OF VIRGINIA,
County of Henrico, ss:

I, the undersigned, director of the National Bank of Virginia, of Richmond, of the State of Virginia, do affirm that I am a citizen of the United States and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said act; and the same is not hypothecated, or in any way pledged as security for any loan or debt.

J. W. ALLISON.

Subscribed and affirmed to this 15th day of April, 1871, before the undersigned, a notary public of said county.

O. S. MORTON, *N. P.*

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the National Bank of Virginia, of Richmond, Va., of the State of Virginia, do solemnly affirm that we are each citizens of the United States and residents of the State of Virginia, and that we will, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that we are each bona fide owners, in our own right, of the number of shares of stock subscribed by us or standing in our name on the books of the said bank, and required by said act; and the same is not hypothecated, or in any way pledged as security for any loan or debt.

GARNET F. WATSON.
CHAS. T. WORTHAM.
PEYTON WISE.

Subscribed and affirmed to this 12th day of January, 1871, before the undersigned, a notary public of said county.

O. S. MORTON, *N. P.*

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the National Bank of Virginia, of Richmond, of the State of Virginia, do solemnly swear that we are citizens of the United States and residents or the State of Virginia, and that we will, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or permit to be violated, any of the provisions of the act of Congress under which the bank has been organized; and that we are the bona fide owners, in our own right, of the number of shares of stock subscribed by us or standing in our names on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

WM. K. WATTS.
GEO. LEE.

Subscribed and sworn to this eleventh day of January, 1872, before the undersigned, a notary public of said city.

J. M. MURRAY, *Not. Pub.*

[Office of Comptroller of the Currency.—Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the National Bank of Virginia, of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that

each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

E. O. NOLTING,
THOS. W. McCANCE,
H. K. ELLYSON,
G. F. WATSON,
WM. H. PALMER,
JAMES W. ALLISON, JR.,
O. H. CHALKLEY.

Subscribed and sworn to this ninth day of January, 1872, before the undersigned, a notary public of said city.

J. M. MURRAY, *Not. Pub.*

[Office of Comptroller of the Currency.—Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of The National Bank Virginia, of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

CLAIBORNE WATKINS.
THOS. W. McCANCE.
JAMES T. GRAY.
E. O. NOLTING.
WM. K. WATTS.
H. F. ELLYSON.
WM. E. TANNER.
T. WM. PEMBERTON.
GARRET F. WATSON.

Subscribed and sworn to this fifteenth day of January, 1873, before the undersigned, a notary public of said city.

J. M. MURRAY, *Not. Pub.*

[Office of Comptroller of the Currency.—Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The National Bank of Virginia, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

E. O. NOLTING.
THOS. W. McCANCE.
CLAIBORNE WATKINS.
JAMES T. GRAY.
O. H. CHALKLY.
JOHN T. ALLEN.
H. K. ELLYSON.
WM. H. PALMER.
WM. K. WATTS.
JAMES W. ALLISON.

Subscribed and sworn to this 13th day of January, 1874, before the undersigned, a notary public of said county.

J. M. MURRAY, *N. P.*

[Office of Comptroller of the Currency.—Form No. 3.]

Oath of directors.

STATE OF VIRGINIA,
City of Richmond, County of Henrico, ss:

We, the undersigned, directors of The National Bank Virginia, of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

T. WM. PEMBERTON.
GARRET F. WATSON.

Subscribed and sworn to this 17th day of January, 1874, before the undersigned, a notary public of said county.

J. M. MURRAY, *Not. Pub.*

STATE OF VIRGINIA,
City of Richmond, ss:

We the undersigned, directors of The Planters National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

J. B. DAVIS.
J. A. BELVIN.
W. M. WILSON.
S. M. ROSENBAUM.
GEO. S. PALMER.
JNO. K. CHILDREY.
E. D. CHRISTIAN.
J. B. PASS.

Subscribed and sworn to this 18th day of January, 1875, before the undersigned, a notary public of said city.

WM. LINTON, *N. P.*

[Office of Comptroller of the Currency.—Form No. 4.]

Oath of director.

STATE OF VIRGINIA,
City of Richmond, ss:

I, the undersigned, director of the Planters National Bank of city of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of ———, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

ALLEN M. LYON.

Subscribed and sworn to this 22d day of May, 1877, before the undersigned, a notary public of said city.

[SEAL OF NOTARY.] WM. LINTON, *N. P.*

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, national bank act.)

[Office of Comptroller of the Currency.—Form No. 4.]

Oath of director.

STATE OF VIRGINIA,
City of Richmond, ss:

I, the undersigned, director of the Planters National Nank of city of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of ——, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

CHARLES PHILIPS.

Subscribed and sworn to this 22d day of May, 1877, before the undersigned, a notary public of said cityy.

[SEAL OF NOTARY.] WM. LINTON, *N. P.*

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, national bank act.)

[Office of Comptroller of the Currency.—Form No. 4.]

Oath of director.

STATE OF VIRGINIA,
City of Richmond, ss:

I, the undersigned, director of the Planters National Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the Revised Statutes of the United States under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said Revised Statutes; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

JOHN B. DAVIS.
JNO. K. CHILDREY.
N. M. WILSON.
L. M. ROSENBAUM.
E. D. CHRISTIAN.
J. A. BELVIN.

Subscribed and sworn to this 8th day of May, 1877, before the undersigned, a notary public of said city.

[SEAL OF NOTARY.] WM. LINTON, *N. P.*

Every director, when elected, must at once take the above oath, and transmit the same immediately to the Comptroller of the Currency. (See paragraph 29, national bank act.)

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the Planters National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as

the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

S. C. ROBINSON.
JOSEPH R. ANDERSON.
L. GROVE GUNIRELY.
J. A. BELVIN.
GEO. S. PALMER.
W. S. DONNAN.
ALFRED HOSE.
L. H. FRAYSER.
CHAS. E. WHITLOCK.
L. M. GLAZEBROCK.
NOTHILL WILSON.
JAMES B. DUPEY.

Subscribed and sworn to this sixth day of December, 1865, before the undersigned, a notary public of said county.

[SEAL.] EDW. J. WARREN, *Notary Public.*

[6 stamp. E. J. W. Dec. 6, 1865.]

STATE OF MARYLAND,
City of Baltimore, ss:

I, the undersigned director of The Planters National Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of Maryland, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me, or standing in my name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

WM. Y. DEFORD.

Subscribed and sworn to this eight day of December, before the undersigned, a notary public of said city.

[SEAL.] T. R. RICH, *Notary Public.*

[5c. stamp. T. R. R. Dec. 8, '65.]

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of The Planters National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will, severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

WM. W. CRUMP.
JOS. ROSENBAUM.

Subscribed and sworn to this 7th day of March, 1866, before the undersigned, notary public of said county.

EDW. J. WARREN.

[5 stamp. E. J. W. 3-7, '66.]

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned directors of The Planters National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the

duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

S. C. ROBINSON.
W. GODDIN.
GEO. S. PALMER.
J. A. BELVIN.
RO. A. MAYE.
JNO. G. SUBLETT.
L. H. FRAYSER.
J. B. DUPEY.
W. S. DONNAN.
NATH'L M. WILSON.
CHS. E. WHITLOCK.
W. W. CRUMP.

Subscribed and sworn to this 11 day of January, 1866, before the undersigned notary public of said county.

[SEAL.]

EDWD J. WARREN,
Notary Public.

[5 stamp, B. J. W., N. P., 1866.]

STATE OF VIRGINIA,
County of Henrico, ss:

I, the undersigned director of The Planters National Bank of Richmond, of the State of Virginia, do solemnly swear that I am a citizen of the United States, and resident of the State of Virginia, and that I will, so far as the duty devolves on me, diligently and honestly administer the affairs of said bank; and that I will not knowingly violate, or willingly permit to violated, any of the provisions of the act of Congress under which this bank has been organized; and that I am the bona fide owner, in my own right, of the number of shares of stock subscribed by me or standing in my name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

JOS. ROSENBEAUM.

Subscribed and sworn to this 28th day of January, 1866, before the undersigned, a notary public of said county.

[5 stamp.]

EDW. J. WARREN,
Notary Public.

STATE OF VIRGINIA,
County of Henrico, ss:

We the undersigned directors of The Planters National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

WM. H. McFARLAND.
S. C. ROBINSON.
W. S. DONNAN.
L. H. FRAYSER.
GEO. S. PALMER.
JNO. S. SUBLETT.
NATH. M. WILSON.
J. B. DUPEY.
J. A. BELVIN.

Subscribed and sworn to this 14th day of January, 1868, before the undersigned, a notary public of said county.

EDW. J. WARREN, *N. P.*

[5 stamp.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the Planters' National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

WM. H. MACFARLAND.
ABRAHAM WARWICK.
L. H. FRAYSER.
I. B. DUPUY.
W. M. WILSON.
JNO. T. SUBLETT.
GEO. S. PALMER.
W. S. DONNAN.
W. J. YARBROUGH.

Subscribed and sworn to this 12th day of January, 1869, before the undersigned, a notary public of said county.

EDW'D J. WARREN, *N. P.*

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the Planters' Nalt. Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

J. R. DAVIS.
J. A. BELVIN.
CHAS. E. WHITLOCK.
W. M. WILSON.
L. H. FRAYSER.
W. J. YARBROUGH.
S. M. ROSENBAUM.
GEO. S. PALMER.
JNO. K. CHILDRESS.

Subscribed and sworn to this 11th day of Jan'y, 1870, before the undersigned, a notary public of said county.

EDW'D J. WARREN, *N. P.*

[5-ct. rev. sta'p, canceled.]

Oath of directors.

STATE OF VIRGINIA,
County of Henrico, ss:

We, the undersigned, directors of the Planters' National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, so far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required

by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

JOHN R. DAVIS.
CHAS. E. WHITLOCK.
JNO. K. CHILDRESS.
CHARLES PHILIPS.
N. M. WILSON.
S. M. ROSENBAUM.
J. A. BELVIN.
L. H. FRAYSER.
GEO. S. PALMER.

Subscribed and sworn to this 12th day of January, 1871, before the undersigned, a notary public of said city.

EDW'D J. WARREN, *N. P.*

STATE OF VIRGINIA,
City of Richmond, County of Henrico, ss:

We, the undersigned, directors of the Planters' National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that we are the bona fide owners, in *his* our own right, of the number of shares of stock subscribed by us or standing in our names on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

J. B. DAVIS.
JNO. K. CHILDRESS.
GEO. S. PALMER.
S. M. ROSENBAUM.
N. M. WILSON.
CHARLES PHILIPS.
CHARLES E. WHITLOCK.
N. B. ELVIN.
L. H. FRAYSER.

Subscribed and sworn to this 25th day of January, 1872, before the undersigned, a notary public of said city.

EDWIN J. WARREN, *N. P.*

STATE OF VIRGINIA,
City of Richmond, ss:

We, the undersigned, directors of the Planters' National Bank of Richmond, of the State of Virginia, do each of us solemnly swear that we are citizens of the United States, and residents of the State of Virginia, and that we will severally, as far as the duty devolves on us, diligently and honestly administer the affairs of said bank; and that we will not knowingly violate, or willingly permit to be violated, any of the provisions of the act of Congress under which this bank has been organized; and that each of us is the bona fide owner, in his own right, of the number of shares of stock subscribed by him or standing in his name on the books of the said bank, and required by said act; and that the same is not hypothecated, or in any way pledged as security for any loan or debt.

JOHN B. DAVIS.
W. B. ELVIN.
N. M. WILSON.
S. M. ROSENBAUM.
CHARLES PHILLIPS.
JNO. K. CHILDREY.
GEO. S. PALMER.
J. B. PACE.
L. H. FRAYSER.
CHARLES E. WHITLOCK.

Subscribed and sworn to this 21st day of January, 1873, before the undersigned, a notary public of said city.

T. B. STARKE, *N. P.*

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 189.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A communication from the Chief of Engineers, with report from Lieut. Col. Q. A. Gillmore, Corps of Engineers, upon survey made with the view of opening a steamboat communication from Saint John's River, Florida, by way of Topokalija Lake to Charlotte Harbor or Peace Creek.

JUNE 5, 1882.—Referred to the Committee on Printing.
JULY 1, 1882.—Ordered printed.

WAR DEPARTMENT,
Washington City, June 1, 1882.

The Secretary of War has the honor to transmit to the United States Senate, for the information of the Committee on Commerce, a communication from the Chief of Engineers, of yesterday's date, and the accompanying copy of a report from Lieut. Col. Q. A. Gillmore, Corps of Engineers, upon a survey made in compliance with requirements in the river and harbor act of June 14, 1880, with the view of opening a steamboat communication from Saint John's River, Florida, by way of Topokalija Lake, to Charlotte Harbor or Pease Creek.

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT *pro tempore*
of the United States Senate.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., May 31, 1882.

SIR: I have the honor to submit herewith a copy of a report to this office from Lieut. Col. Q. A. Gillmore, Corps of Engineers, of the results of a survey made under his direction, in compliance with the requirements of the river and harbor act of June 14, 1880, with the view of opening a steamboat communication from Saint John's River, Florida, by way of Topokalija Lake, to Charlotte Harbor or Pease Creek.

Very respectfully, your obedient servant,

H. G. WRIGHT,
Chief of Engineers, Brig. and Bvt. Maj. Gen.

Hon. ROBERT T. LINCOLN,
Secretary of War.

SURVEY FOR OPENING OF STEAMBOAT COMMUNICATION FROM THE SAINT JOHN'S RIVER, FLORIDA, BY WAY OF TOPOKALIJA LAKE, TO CHARLOTTE HARBOR OR PEASE CREEK.

UNITED STATES ENGINEER'S OFFICE.
New York, May 23, 1882.

GENERAL: Section 2 of the river and harbor act, approved June 14, 1880, provided that the Secretary of War be directed to cause an examination or survey, or both, with estimates of cost, to be made for the opening of steamboat communication from the Saint John's River, Florida, by way of Topokalija Lake, to Charlotte Harbor or Peace Creek.

By department letter dated June 17, 1880, the work was assigned to my charge, and I have the honor to submit the following report thereon, which has been made as full as the limited means at my disposal would permit.

The general location of the lines to be examined or surveyed was indicated by the condition that Topokalija, or more correctly Tohopokeliga, Lake should constitute an integral part of the route, and the field work was planned and executed accordingly.

The great extent of country representing the site of the operations, the innumerable difficulties encountered in the wilderness of swamps, marshes, and prairies through which very many miles of the survey had to be run, and an almost total absence of any regular or organized means of communication have intervened to prevent a thorough and in all respects satisfactory accomplishment of the object in view.

It is believed, however, that the leading object of the survey, which has been understood to be the determination of the feasibility, or otherwise, of a project for opening up steamboat communication between the points indicated in the act, has been fully attained.

Assistant Engineer G. Daubeney was originally selected to conduct the survey. He proceeded to Florida in December, 1880, where he was for some time engaged in examining the Upper Saint John's River, in procuring information necessary for deciding upon a detailed plan of operations, in obtaining numerous copies of township maps from the United States land office at Gainesville, Fla., and in making arrangements for transportation and supplies.

The first party took the field February 1, 1881, and another very soon thereafter.

During the month of March, 1881, Mr. Daubeney was relieved from his duties at his own request, and Mr. W. G. Williamson, of Lexington, Va., was appointed his successor. His assistants on the survey, in charge of parties, were Mr. I. F. Le Baron, Mr. J. Gartland, and Mr. R. Paulsen.

The field work was completed, so far as the funds allotted therefor would allow, in July, 1881.

Since the act providing for the survey explicitly states that the contemplated route should include Lake Tohopokeliga, the principal lines examined and surveyed were run so as to connect that lake with the eastern and western terminal points indicated in the act. Practically the operations extended from longitude 80° 48′ west to longitude 82° 15′ west, and from latitude 26° 30′ north to latitude 28° 30′ north.

Neither the terminal point of the route on the Saint John's River nor the draught and tonnage of steamboats to be accommodated had been indicated in the act. Mr. Daubeney's examination of that river from

Lake Monroe to Lake Winder showed that although it was in some places only about 50 feet wide, it contained plenty of water for a stern-wheel steamboat about 70 feet long, with 20 feet beam and drawing 3 feet of water. Assistant Williamson says of this reach that it is extremely crooked and in some places quite shoal, but thinks it capable of being made navigable for boats drawing from 4 to 5 feet of water. That section of the river between Lakes Poinsett and Winder was found to be as good in regard to navigation as any of the other reaches above Lake Harney, and since that section was nearest to the given intermediate point of the route, Lake Tohopokeliga, it was decided to run a transit and level line from that lake to either Lake Poinsett or Winder.

A line to Lake Poinsett was found to be impracticable for the passage of a team, which necessarily had to accompany a party carrying with it a quantity of provisions and other material. A transit and level line to Lake Winder was then chosen and successfully run.

The surface of Lake Winder was found to be at an elevation of 18.737 feet above the mean high-water level of the Gulf at the mouth of Peace Creek.

The eastern terminus of the line on that lake was located near Fort Taylor, at the mouth of Wolf Creeks, township 26 south, range 35 east.

It was assumed that in order to comply fully with the requirements of the act of Congress it was necessary to determine whether a practicable route might be established by utilizing as portions of it the lakes between Tohopokeliga Lake and Upper Saint John's River, on the east side, and certain other lakes situated between Tohopokeliga Lake and Peace Creek on the west side.

It was likewise assumed that the act contemplated a water route without locks, suitable for such steamboats as are able to ascend the Saint John's River as far up as Lake Winder.

From the facts developed by the surveys and examinations of Mr. Williamson and his assistants the conclusion is reached that it is not practicable to establish a through route from the Saint John's River, by way of Tohopokeliga Lake, to Charlotte Harbor or Peace Creek, on the west coast of the Florida peninsula, without the employment of locks, except perhaps at a cost plainly unwarranted by the amount of traffic and the extent of population that would for many years to come be accommodated by it.

For convenience of description the route via Tohopokeliga Lake, as surveyed, will be considered as composed of three sections, to wit: An easterly section, from Lake Winder to Tohopokeliga Lake; a central section, from the last named lake to Lake Kissimmee; and a westerly section, from Lake Kissimmee west to Peace Creek, and following that creek down to its entrance into Charlotte Harbor. These different sections will be briefly reviewed.

EASTERLY SECTION.

There are two lakes of importance situated between the terminal points of this section that might be utilized either as parts of the route or as reservoirs for supplying it with water. They are Little Tohopokeliga Lake, with an area of 20.75 square miles of water surface, and Alligator Lake, having an area of 5.83 square miles. A small sheet of water, Lake Isabel, of about half a square mile area, lies between them. Tohopokeliga Lake extends over an area of about 26 square miles. At the time of the survey its water level was 45.856 feet above that of Lake Winder, and from 6 to 7 feet below that of the three in-

termediate lakes named, which are practically on the same level, the smallest lake being slightly the highest of the three.

By the transit and level line run from Lake Winder to the Lakes Tohopokeliga, by way of the intermediate lakes, the distance is 41.68 miles, and from the northeasterly point of Tohopokeliga Lake, the terminal point of the transit line, down the lake to the exit of Kissimmee River, 11.3 miles more, or an aggregate length of 52.98 miles from Lake Winder to the outflow of the river.

An open cut along such a route would result in draining the water of the three intermediate lakes and their tributary swamps, into Tohopokeliga Lake, unless a lock is interposed between the two Tohopokeliga Lakes.

Assistant Williamson suggests, without recommending it, a shorter line by connecting Alligator Lake directly with Tohopokeliga Lake, but says that a lock would likewise be necessary between these two lakes.

A third scheme might consist in connecting Lake Winder by nearly a straight line with Tohopokeliga Lake near its southern end. The length of this line to the exit or head of Kissimmee River, at the south end of the last named lake, would be about 32 miles, of which about 30 miles is in excavation.

Such a line, if locks could be dispensed with, would not be impossible in regard to the currents that would be produced in it during ordinary low-water stages. The difference of the elevation of the water level at the two ends of the cut is shown by the survey to be 45.856 feet, equal to a slope of .0002895, or 18.34 inches per mile.

With a normal cross-section of the canal of 40 feet width at bottom, 65 feet width at the water surface, and 5 feet depth, the mean velocity of the current would be about 2.577 feet per second, or $1\frac{3}{4}$ miles per hour, which would not be objectionable.

The volume of discharge, under such conditions, amounts to 676 cubic feet per second. During a month of thirty days the consumption of water, to maintain a depth of 5 feet in the cut, would amount to not less than 1,753,400,000 cubic feet, without estimating for losses by evaporation and filtration. Possibly there would be no loss from the latter source that would not be compensated by infiltration owing to the depth of the cut.

But a little calculation shows that during the dry season of the year the quantity of water required for keeping the open cut in navigable condition cannot be secured from the rainfall occurring in that time.

Observations in regard to rainfall have for several years been made at Punta Rassa, near the mouth of the Caloosahatchie, by the United States Signal Service, and the general data of these observations are appended to Assistant Williamson's report. In this part of the country the driest months of the year are generally February, March, and April. During these three months, in 1881, while the survey was in progress, the aggregate rainfall amounted to 2.24 inches. Allowing that one-third of this quantity could be drawn into the canal, it would require a drainage area of over 3,000 square miles to supply the canal with water if dependence be placed solely on the rainfall during the three months.

Such an area would be equal in extent to about eighty-four townships, and a glance at the map clearly shows that it would not be available.

Gates would therefore be needed at the several lakes serving as reservoirs for retaining the water collected during the rainy season, and for regulating the outflow; but even then the result would be doubtful and uncertain, for the following reasons:

Tohopokeliga Lake, together with the Little Tohopokeliga, Lake Isa-

bel, and Alligator Lake, have an aggregate area of water surface of about 53 square miles. The area of the swamps, &c., tributary to these lakes is estimated at 250 square miles.

The evaporation at the water surface of the lakes may be estimated at three-tenths of an inch per day. Assuming the favorable case that at the swamps the daily evaporation amounts only in the aggregate to one-tenth of an inch, and supposing that a large proportion of the water sinks down low enough to escape evaporation, to appear subsequently as subterranean feed-water, it is found that during the eight months comprising the dry and the wet season of the year it would require a rainfall of about 52 inches to furnish the canal with water and provide for evaporation. But the observed rainfall at Punta Rassa in the rainy months from May to October, 1880, amounted only to 22.58 inches, which, added to the rainfall of 2.24 inches during the three dry months in the first part of the year 1881, gives an aggregate of only 24.82 inches.

Assuming even that further investigations may show the probability of a more abundant water supply than seems to be possible under the circumstances, the great depths which a cut without locks would reach at many points are highly objectionable. At some places the line would pass over ground about 60 feet above Lake Winder, and the excavation would be over 45 feet deep. The average depth of the cut would probably be about 30 feet. With a berme 4 feet wide on each side of the canal, placed on the ordinary water level, and with side slopes above of $1\frac{1}{2}$ base to 1 in height, the aggregate amount of excavation needed on the eastern section would reach 12,000,000 cubic yards of material. It is impossible to form even an approximate estimate of the cost of such an undertaking without such a knowledge of the nature of the lower strata of the ground as could be furnished only by a comprehensive series of borings.

Another point deserves attention. It is a peculiar feature of the soil of Florida, owing to its sandy and generally nearly level surface, that a large portion of the rain-water is absorbed and sinks down into the ground.

The subsoil is a well-stocked receptacle and storage magazine of the rain-water thus absorbed, from which, by innumerable subterranean veins and rivulets, the lakes and ponds are fed. This condition is very favorable to the employment of the large lakes as natural reservoirs for a canal with locks, since the demand for water to operate such a canal would be moderate enough to cause no violent disturbance of the existing hydraulic relations. But an open and comparatively deep cut would soon cause a very active flow of these subterranean waters to its bed, which would probably be abundantly provided with water from that source for a certain length of time. But gradually the level of these subterranean waters will be lowered by the unceasing drain, the stock of stored-up water will become exhausted, and while the swamps may be reclaimed by the operation, their usefulness as direct or indirect feeding reservoirs to the canal will be destroyed or very materially impaired.

Moreover, a deep cut would act as a catch-basin for the flood waters for miles on each side during the rainy season, and carry them down to the Saint John's River, increasing the destructive effects of freshets in the valley of that river. The cut would actually be a great channel of drainage for the upper part of the eastern section, and would probably effect the reclamation of a very large area of swamp land which is now useless, but it would also drain off a vast amount of water which,

if retained, would have been available for purposes of navigation during the dry season.

CENTRAL SECTION.

This part of the route comprises the Kissimmee River from its head or point of exit at the southern end of Tohopokeliga Lake down to Kissimmee Lake.

The river passes on its course through two lakes—Little Cypress Lake, with an area of 6 square miles, and Big Cypress Lake (Hatchinihaw), having an area of 18.38 square miles. It enters Kissimmee Lake at its northern end, near Fort Gardner. The southern terminal point of the line as surveyed is at or near the point where Tiger Creek enters Kissimmee Lake from the southwest, about $2\frac{2}{3}$ miles south of the entrance of Kissimmee River into the lake. The whole length of this section, by river and lake, is about 25 miles, of which a portion 15.8 miles long forms the river route; the balance is lake route.

The total fall from end to end of this section was found to be 5.925 feet, Kissimmee Lake at the mouth of Tiger Creek being at an elevation of 39.931 feet above Lake Winder, and 58.668 feet above mean high water in Charlotte Harbor.

The central section is entirely practicable for a steamboat line of communication without locks; in fact it has been used for some time past by a light-draught steamboat plying between Tohopokeliga Lake and Lake Okeechobee, into which Kissimmee River discharges. The river, however, requires to be improved at several points by widening and straightening. A uniform enlargement of the river to the dimensions assumed in discussing the eastern section would undoubtedly result in drawing off a larger volume of water from Tohopokeliga Lake than heretofore, and would render an ample supply of water for an open cut in the eastern section still more precarious.

WESTERLY SECTION.

The western branch of the route surveyed begins on the west side of Kissimmee Lake, at the mouth of Tiger Creek.

Going westward, a number of lakes are met with. They are named as follows, in the order from east to west:

Tiger Lake (or Lake Kot-sa);
Lake Walk-in-the-water (or We-oh-ya-rap-kah);
Lake Lenoir;
Little Tiger Lake;
Crooked Lake (Oh-kah-shay-kon-hee);
Lake Buffum.

Every successive lake, going in a westerly direction, is higher than the preceding one; Lake Buffum, the most westerly one and nearest to Peace Creek, being the summit or highest lake of all. Its water level was found to be 79.597 feet above Kissimmee Lake, 73.672 feet above Tohopokeliga Lake, 119.528 feet above Lake Winder, and 138.265 feet above mean high-water of the Gulf.

The distance from Kissimmee Lake to Lake Buffum by the line surveyed is 26.57 miles. In a straight line it would measure about 21 miles. On this line the ridge that traverses the peninsula of Florida from north to south was crossed.

The summit point was found between Little Tiger Lake and Crooked Lake, about $16\frac{1}{2}$ miles southwest from the initial point on Kissimmee Lake. This point is at an elevation of 163.257 feet above the Gulf and about 25 feet above Lake Buffum.

Between Lake Buffum and Fort Meade, on Peace Creek, high sand hills exist; for which reason the line of survey followed Bowlegs Creek, the outlet of Lake Buffum, to its junction with Peace Creek, 2.8 miles below Fort Meade. On the length of about 15 miles, from Lake Buffum to its mouth, Bowlegs Creek falls 65.125 feet. From the junction to the mouth of Peace Creek, at Charlotte Harbor, the length of that river is 95.36 miles.

It will be evident from this brief description that a number of locks would be necessary on the line from Kissimmee Lake to Peace Creek; indeed, a mere glance at the longitudinal profile shows that they are indispensable.

It was thought advisable to ascertain whether Peace Creek could be reached more conveniently by following the creek named Big Charley-popka, its most important tributary from the east.

A transit and level line was run from Lake Lockapopka (about 1 mile southeast of Crooked Lake; elevation above the Gulf, 116.63 feet) in a southerly direction to the headwaters of the Charleypopka, passing the highest ridge or divides, 134 feet above the Gulf level, about 9 miles south of Lake Lockapopka. The survey then followed Big Charley-popka to its entrance into Peace Creek above, 51½ miles from the mouth of the latter, and 47⅔ miles below Fort Meade.

It was found that the Big Charleypopka was generally too narrow and crooked to be navigated, even during flood stages, except perhaps by straightening and deepening it at great expense, especially since lime rock and rotten sand rock was found to exist at several places, either in the bed of the creek or in its vicinity. At low-water it would afford no navigation for lack of water.

Peace Creek was examined from Fort Meade to its mouth by means of an instrumental boat survey. The total length, by stadia measure-ment, was found to be 98.196 miles; in a straight line it would only be about 55 miles.

The principal obstructions to navigation, besides its great tortuous-ness, especially in the upper portion, are thousands of snags and lean-ing trees and numerous sand and rock shoals.

During high stages of the water light-draught steamers might ascend the creek to Fort Meade if the snags and leaning trees were removed, but to render it navigable during the dry season the lock and dam sys-tem would most probably be required.

It is quite clear that a steamboat route without locks from the Saint John's River to Peace Creek, on the route designated by Con-gress, is not practicable on account of the obstacles met with on the eastern and western sections.

An alternative project was thought of, but the necessary survey or examination was not completed; moreover, by that project only the western section would have been modified, while the eastern section would still have formed a part of it.

This project consisted in continuing the central section further south through Kissimmee Lake and down Kissimmee River to Lake Okeechobee, and through that lake, by way of the Caloosahatchie, to San Carlos Bay.

It is true that the act of Congress names Peace Creek or Charlotte Harbor as the western terminal points of the route; but since San Car-los Bay is connected with Charlotte Harbor by Pine Island Sound and Matlacha Pass, it was assumed that this route would perhaps come within the meaning of the act.

On this assumption it can scarcely be doubted that such a route would represent a solution of the problem, provided the eastern section as de-

scribed were entirely practicable. Kissimmee River is now navigable for small steamboats, although it requires a good deal of improvement in the way of straightening and otherwise correcting its course, and there is no question about sufficient depth in Okeechobee Lake, except near its banks.

Kissimmee River was cursorily examined as far down as Fort Kissimmee, a few miles below the boundary line of Polk and Brevard counties.

A rapid reconniassance only could be made of the Caloosahatchie, from its mouth to its headwaters in Lake Hikpochee, a few miles west of Okeechobee Lake.

Hikpochee Lake is undoubtedly fed from Okeechobee, but an uncommonly dense growth of very tall saw-grass has repeatedly foiled the attempts of parties to pass through. It also happened that the examining party had to be recalled just at that juncture because the funds were nearly exhausted.

The total length of the Caloosahatchie is estimated at about 65 miles. No levels could be taken on this examination. From the report made to Capt. A. N. Damrell, United States Engineers, by Mr. J. L. Meigs, who examined the river, and ran a line of levels from Lake Hikpochee to low water at Fort Myers (see Annual Report of the Chief of Engineers, 1879), it appears that the aggregate fall in that distance was 21.94 feet. He could not penetrate to Okeechobee Lake, but assumed it to be on the same level with Lake Hikpochee. It is said that a recent leveling operation executed by a private company has shown Okeechobee Lake to be about 2½ feet higher than Lake Hikpochee, a difference of level that seems to be rather excessive.

At times of flood large volumes of water pour through the belt of saw-grass from Okeechobee Lake to Lake Hikpochee and down the Caloosahatchie to the Gulf. At such times the river is subject to excessive and long-continued overflows, and many settlements, especially between Fort Myers and Fort Thompson, have been abandoned for that reason.

From Lake Hikpochee down, the river was found to flow in many channels through tall saw-grass and other aquatic plants to Lake Flirt, a large expanse of water filled with lilies and grass, and with several channels through it. From that place the river is clearer, gradually increasing in width from 100 feet upward.

The Caloosahatchie assumes the character of an estuary of the Gulf some miles above Fort Myers.

As a preliminary improvement of the river, the removal of numerous snags and leaning trees below Fort Thompson, and of a few shoals, notably Beautiful Island shoal, would doubtless be necessary. But a more comprehensive regulation of its course would consist in cutting a wide and deep channel through the saw-grass marsh between Lakes Hikpochee and Okeechobee, and extending it to and below Lake Flirt, as well as deepening and otherwise regulating the course of the river lower down to accommodate an increased flow of water.

It was not thought expedient to prepare an estimate of the probable cost of a permanent and thorough improvement of the Caloosahatchie, inasmuch as a regular survey of the river should be made first, and the whole question requires further study. In its improved condition the river would act at all seasons of the year as the great channel of drainage of Okeechobee Lake. At the same time its depth, area of cross-section, and slope should be so managed as to keep the river within its banks, prevent the recurrence of disastrous overflows, and render the rich and productive lands adjoining the banks attractive to settlers.

It may not be impossible to establish a steamboat route without locks

from the Saint John's River to Charlotte Harbor, but not by way of Tohopokeliga Lake. The easterly section should be placed farther south.

From the information obtained by Assistants Williamson and Le Baron, a canal without locks can possibly be cut from the headwaters of the Saint John's River, south of Lake Washington, to the northern end of Okeechobee Lake.

The length of the cut would be about 48 miles, three-fourths of which would be through morasses so boggy that the surveyors of the United States Land Office have been unable to penetrate them to subdivide them, pronouncing them impassable.

Either Taylor's or Cow Creek, both tributaries of Okeechobee Lake, might be improved and form the southern portion of the eastern section.

Nearly the whole tract of land to be traversed by such a cut is said to be usually covered with from two to four feet of water during the rainy season; from which it may be concluded that the land is generally low and level.

The difference of elevation between the two terminal points of this section is not known; it is believed to be small. According to the level taken at the recent survey, Lake Winder is 18.74 feet above high-water at Charlotte Harbor, where the mean rise and fall of tides is 1.7 feet. Assistant Meigs, during his examination of the Caloosahatchie, found Lake Hikpochee 21.94 feet above low-water at Fort Myers. Assuming the same amount of rise and fall of tides to exist at the mouth of Peace Creek as at Fort Myers, and that Lake Hikpochee is on the same level with Okeechobee Lake, the water surface of the latter is 20.24 feet above high-water of Charlotte Harbor, and 1.5 feet above that of Lake Winder.

Some idea may be formed of the probable elevation of Lake Washington and of the headwaters of the Saint John's River by referring to the survey of a canal route from the Saint John's River to Espiritu, Santa Bay (Tampa Bay), made by Lieut. M. L. Smith, United States Topographical Engineers. Extracts of his report dated May 1, 1855, are reprinted in the Annual Report of the Chief of Engineers, 1876. The eastern terminal point of the route recommended by Lieutenant Smith was located at the entrance of the Weekivah into the Saint John's River, about 4 miles below Lake Monroe; the western end at the mouth of Hillsboro' River, at the north end of Hillsboro' Bay, a branch of Tampa Bay. He reports the water-level of the Saint John's River at the point indicated to be 12 feet above low-water of Tampa Bay, where the mean rise and fall of tides is 1.4 feet, according to the Coast Survey chart of 1876. At the mouth of the Weekivah, Saint John's River is, therefore, 10.6 feet above high-water of the Gulf, the datum to which the levels of last year's survey have been reduced.

Lake Winder is 18.74 feet above high water of the Gulf; consequently there must be a fall of 8.14 feet from that lake to the mouth of the Weekivah, a distance by river estimated at 90 miles, more or less. From Lake Winder to the headwaters of the Saint John's River it is about 30 miles. If we assume a similar slope of the water-surface of the river on that reach, the headwaters will be about 21.45 feet above the Gulf, or 1.21 feet above Okeechobee Lake. They may be somewhat higher, but in a length of cut of 48 miles a fall of a few feet will not signify. The necessity of a lock is not entirely excluded, however, to prevent a drainage of the swamps feeding the headwaters of the Saint John's River in the direction of Okeechobee Lake, producing possibly a scarcity of water in the upper reach of that river.

The plan of the through route would therefore be simply as follows: A

cut from the headwaters of the Saint John's River to Okeechobee Lake, utilizing either Taylor's Creek or Cow Creek, and then through the lake to the Gulf by way of the Caloosahatchie.

It must be admitted that little or nothing is known authentically of the condition of the Upper Saint John's from Lake Winder to the headwaters; that it would probably require a considerable amount of work in straightening its course and in widening and deepening its bed; that after enlarging it to suitable dimensions we are not assured that enough water will find its way into it from the adjacent swamps to preserve it at its minimum depth during the dry season without going to the expense of cutting a number of long lateral drains to convey to the improved river the necessary water from more distant parts; and that the number of lakes through which the river naturally passes is increased in regard to the route suggested, tapping the river at its headwaters, every one of which lakes will probably have a bar at the river's inlet requiring special works for their improvement. The higher upon the river the initial point of the water route is taken, the more will the draught of vessels be reduced that can ascend to that point. There is a limit to the amount of water that can be supplied to the improved river from available sources. The question may be said to stand as follows: While a route without locks is possibly feasible when starting from the headwaters of the Saint John's or from Lake Washington, it can be used only by boats of very light draught, while by starting from points lower down vessels of greater draught can be accommodated by a canal with locks.

Another feasible line may be found, running from Kissimmee River to the Upper Saint John's River, by way of Lake Marianna; considerring the Lower Kissimmee River as a part of the route and retaining Okechobee Lake and the Caloosahatchie. Most probably, however, such a line would require locks, though, perhaps, only a few.

Assistant Le Baron suggests as not improbable a steamboat route by way of Trout-eating Creek (Tsalapopkahatchie) from the mouth of Peace Creek to the headwaters of Fish-eating Creek (Tlathapopkahatchie), a tributary of Okeechobee Lake; thence through some intermediate lake to Great Istokpoga Lake and to Kissimmee River, and thence to the headwarters of the Saint John's River. Nothing whatever is known as to the possibilities of this route; the chances are that locks are necessary, as well as considerable excavation.

It is thought that if a route from the Saint John's River to Charlotte Harbor be established, it should not only accommodate through traffic, but should also promote the development of a wide strip of land adjoining its bank, to secure transportation of produce and merchandise from and to intermediate points on the line. For that purpose, it seems, the route should serve as a means of preventing destructive overflows during the rainy season, so that settlers may not have their cultivated lands desolated by floods. An open cut of sufficient dimensions, without locks, and with an adequate slope of its water-surface, will most securely draw off the flood waters; but there will be more or less uncertainty about the navigability of the canal in dry weather. A canal with locks can be relied on, if properly located, to have a sufficiency of water during the dry months. In proportion, however, as its level reaches between the locks operate to prevent a rapid draining off of the surplus water in the rainy season the settled districts along its banks would be threatened by inundation. In such cases the lock-gates might be opened to let the superabundant flood water escape; but the operation would require careful management to prevent the loss of storage water

needed during the dry season. These antagonistic relations make the problem sufficiently complicated.

APPROXIMATE ESTIMATE OF THE COST OF A STEAMBOAT ROUTE WITH LOCKS FROM THE SAINT JOHN'S RIVER TO PEACE CREEK OR CHARLOTTE HARBOR, BY WAY OF TOHOPOKELIGA LAKE.

The canal is supposed to have a width of 40 feet at the bottom and 5 feet depth of water, as already indicated. The locks to be 25 feet wide with 125 feet useful length and an average lift of 8 feet.

The estimate is necessarily only a rough approximation, since the Saint John's River, which has to be improved from Lake George to Lake Winder, a distance of 70 miles, was only superficially examined, and Peace Creek has not yet been regularly surveyed; moreover, only a small part of the canal sections of the route upon which the estimates are based is assumed to be located exactly upon any one of the lines run, varying more or less therefore, and not always in the interests of diminished cost.

The Saint John's River, which from Lake George to Lake Winder is used as an easterly approach to the canal, is very crooked in many places, but otherwise generally well suited to such boats as will be able to pass through the canal. From the similarity of this reach of the river to that from Lake Monroe to Lake George, examined and partially surveyed under my direction in March, 1879, it is estimated that it can be straightened and otherwise improved, wherever improvement is necessary, for the sum of $120,000.

For convenience of description the route westward from Saint John's River will be divided into three sections, namely, an eastern section, a central section, and a western section.

1. EASTERN SECTION.

It has been considered expedient not to depend on Tohopokeliga Lake at all for water supply, but leave it as a reservoir for feeding the improved Kissimmee River.

Little Tohopokeliga Lake, Lake Isabel, and Alligator Lake, all of them nearly of the same elevation—about 53 feet above Lake Winder—with the cuts connecting them, constitute the summit level of the section. Probably the lake in Jug Creek Bay may also form a part of this level; its elevation was not taken, but there are indications that it is nearly the same height as Alligator Lake.

The spacious lake north of Alligator Lake and several ponds in the vicinity would form part of the system as auxiliary reservoirs.

These various lakes have an aggregate area of water surface of about 32 square miles. They will, with the surrounding swamps, amply provide the required amount of water.

In the estimate it is assumed that the chain of lakes, from the lake in Jug Creek Bay to Little Tohopokeliga Lake, are connected by open cuts. From Jug Creek Bay to Lake Winder, a distance of 15.7 miles by canal, seven locks will be needed. From Little Tohopokeligo to Tohopokeliga Lake the distance is 4 miles, and one lock is required.

The aggregate length of the eastern section is estimated at 34 miles, to wit:

	Miles.
By canal proper	19.7
By open cuts	6.3
By lakes	8.0
	34.0

Feeders from auxiliary reservoirs may have an aggregate length of 5 miles; they are to be of ample width, say 30 feet at bottom, and will average about 10 feet in depth of cut.

The depth of cut for the canal will average 11½ feet; the maximum depth is about 18 feet, except in one place, where it will be about 25 feet.

The aggregate amount of excavation for canal and feeders is computed at 4,500,000 cubic yards. It will probably be generally easy digging, but as in the deeper cuts more resisting strata may be met with, about 1,000,000 cubic yards are estimated to cost 50 cents a yard, and the balance 25 cents.

Excavation and embankment:	
3,500,000 cubic yards, at 25 cents	$875,000
1,000,000 cubic yards, at 50 cents	500,000
Clearing and grubbing 26 miles of canal, at $1,000	26,000
Clearing and grubbing 5 miles of feeders, at $500	2,500
8 lift locks, at $30,000	240,000
Waste weirs and gates for feeders	12,000
Works at the lakes at the end of line	35,000
Cost of eastern section	1,690,500

2. CENTRAL SECTION.

This section is considered to extend from the northern end of Tohopokeliga Lake, by way of Kissimmee River, to the mouth of Tiger Creek, on Kissimmee Lake.

By this route Tohopokeliga Lake and the most northerly part of Kissimmee Lake, as well as the intermediate lakes, are utilized.

The total length of the section is about 36½ miles, of which an aggregate length of 16 miles is river, while 20½ miles of the line passes through lakes.

The lakes are believed to possess sufficient depth for vessels that would use the canal. The river, although generally deep enough, requires considerable widening and straightening at many places. Bars may also form at the entrances of the improved river into the several lakes, requiring special works at these points.

The work to be done on this section will consist chiefly in dredging and in improving the entrances into the lakes.

300,000 cubic yards dredging, at 20 cents	$60,000
Improving three lake entrances, at $15,000	45,000
Grubbing, &c	10,000
Cost of central section	115,000

3. WESTERN SECTION.

This section is divided into two parts or divisions.

The first division extends from Kissimmee Lake to Peace Creek; the second division comprises Peace Creek itself.

First division of western section.

It is not deemed advisable to include Crooked Lake and Lake Buffum directly in the line of canal, owing to their great elevation above Kissimmee Lake, necessitating a greater number of locks. Moreover, they are not expected, from their high position, to command a large area of swamps and marshes, and they could not be relied on to furnish enough water for the summit-level of the canal.

For this reason Lake Lockapopka is selected as the summit lake, but

it would be connected with Crooked Lake to render the latter available as a supply basin.

Eastward the line of canal would run from Lockapopka through Reedy Lake, Lake Walk-in-the-Water, and Tiger Lake to Kissimmee Lake. Seven locks would be required on this line, four of them on the short reach from Lake Lockapopka to Reedy Lake, which is 32.25 feet below the first-named lake; two locks between Reedy Lake and Lake Walk-in-the-Water (difference of level 16.44 feet); and one lock between the latter lake and Tiger Lake, with a fall of 8.5 feet. From Tiger Lake to Kissimmee Lake there is a fall of about seven-tenths of a foot in a distance of 2 miles. The work would here consist in improving Tiger Creek, which connects the two lakes. Lake Rosalie, which is somewhat higher than Tiger Lake, will be used as a feeding reservoir to the latter lake.

Westward of Lake Lockapopka a cut is proposed to connect the lake with Bowlegs Creek, at a point some 5 or 6 miles below its head, or the south end of Lake Buffum. The point would be selected with a view of having but little slope in the water surface of the proposed cut—less than a foot in a length of about 7 miles. To control the water supply in the cut a lock will be placed at the upper end, near the lake.

From the point just indicated it is proposed to follow Bowlegs Creek down to its debouché into Peace Creek, a length of about $10\frac{1}{4}$ miles, with a fall of about 43 feet.

Bowlegs Creek is a narrow stream, not above 30 feet in width, with about 18 inches of water during the dry season, increasing to from 3 to 5 feet near its mouth. The creek requires widening and deepening, and, at some places, straightening. A better supply of water will be secured by the cut connecting the creek with Lake Lockapopka, and by transforming its upper reach into a feeder from Lake Buffum. But in addition to this the creek must be canalized, else its great slope would prevent the formation of suitable depths and widths.

Ten locks and dams are estimated to be required in Bowlegs Creek. As there is an abundance of good pine timber close by, it is proposed to build crib dams, and use timber extensively in constructing the locks. A substantial lock will be placed at the juncture with Peace Creek.

The length of the first division would be about $38\frac{3}{4}$ miles, of which there would be $16\frac{1}{2}$ miles of canal, 12 miles by lakes, and $10\frac{1}{4}$ miles by canalized creek.

With the disposition here described we may be assured of an ample water supply. But in order to reach Peace Creek we cannot avoid crossing the Florida Ridge, between Lake Lockapopka and Bowlegs Creek.

The average depth of cut between these points, on a length of 7 miles, will be 27 feet, with a maximum depth of about 40 feet.

COST OF FIRST DIVISION, WESTERN SECTION.

a. East of Lake Lockapopka:

3,850,000 cubic yards excavation for canal, at 25 cents	$962,500
900,000 cubic yards excavation for canal, at 50 cents	450,000
150,000 cubic yards excavation for feeders, at 20 cents	30,000
60,000 cubic yards excavation for feeders, at 40 cents	24,000
Grubbing and clearing $16\frac{1}{2}$ miles canal, at $1,000	16,500
Grubbing and clearing $2\frac{1}{2}$ miles feeders, at $500	1,250
Waste weirs, gates for feeders, &c	10,000
8 locks, at $30,000	240,000
Works at Kissimmee Lake	20,000
	1,754,250

b. West of Lake Lockapopka:

100,000 cubic yards excavation or dredging, at 20 cents	$20,000
20,000 cubic yards embankment (borrowed), at 40 cents	8,000
10 locks and dams, at $16,000	160,000
1 lock at junction, Peace Creek	30,000
	218,000
Total first division, western section	1,972,250

Second division of western section.

The total length of Peace Creek, from Fort Meade to Charlotte Harbor, is about 100 miles, but the distance is only 55 miles in a straight line.

The river is therefore very tortuous, especially in its upper reaches. During the dry season it is too shallow at many places for any kind of navigation. The bottom of the bed is generally sand and mud; but sticky clay and rock are also found.

The information gained by the boat survey of last year will scarcely suffice as the basis of a reliable project for improving Peace Creek to such extent as to render it navigable all the year round for steamboats drawing from 3 to 4 feet of water.

While it is thought that the following-named works of improvement may be required, the estimate should be regarded as a very crude approximation only, subject doubtless to material modifications, when a thorough examination shall have been made.

COST OF SECOND DIVISION.

Straightening Peace Creek	$100,000
Removing 3,500 snags, at $10	35,000
Removing 4,000 leaning trees, at $2	8,000
Removing sand shoals, 300,000 cubic yards, at 30 cents	90,000
Removing soft rock shoals, 150,000 cubic yards, at 60 cents	90,000
15 locks and dams, at $20,000	300,000
Total second division, western section	623,000

The total estimated cost, therefore, of building a canal with locks, on the line indicated, giving a navigable depth of 5 feet, including 25 per centum for contingent expenses and $12,000 for additional surveys, is $5,662,812, or, in round numbers, $5,700,000, to wit:

Improving Saint John's River	$120,000
Eastern section of steamboat route	1,690,500
Central section of steamboat route	115,000
Western section of steamboat route	2,595,250
25 per cent. for contingencies	1,130,062
Additional surveys	12,000
Total	5,662,812

No estimate is submitted for the alternative project, referred to in this report, which consists in retaining the eastern section above described, and continuing the central section by the Kissimmee River to Okeechobee Lake, and through that lake by way of the Caloosahatchie to the Gulf.

All that is known of Kissimmee River is that it can be navigated by steamboats of very light draught, and that it is extremely tortuous, and that during the rainy season its banks are overflowed, inundating immense tracts of adjacent land. Okeechobee Lake in its present condition would undoubtedly be navigable for boats drawing from 3 to 4 feet of water. It is vaguely reported, on unknown authority, that its

depth nowhere exceeds 12 to 14 feet. The lake has really never been surveyed—a circumstance partly due to its remoteness from the lines of commerce, and partly to the inaccessibility of its shores.

Attempts, to be briefly referred to further on, are now being made to drain this lake, or to lower very considerably the level of its water surface. Such an operation, when accomplished, would materially affect any project for constructing a steamboat route in that direction that could now be made.

As to the Caloosahatchie, it has been already stated in this report that a well digested plan for its thorough and permanent improvement cannot be formed before it has been regularly surveyed.

All that may now be said in regard to this route, by way of Okeechobee Lake, is that it can probably be established at less cost than that by way of Peace Creek.

On the other hand, there can be no doubt that the approach from the Gulf to the mouth of Peace Creek, through Boca Grande and Charlotte Harbor, the route evidently contemplated in the act under which the recent examination was made, is much more direct and affords better water than the circuitous approach to the mouth of the Caloosahatchie by way of Boca Grande, Pine Island Sound, and San Carlos Bay, which would naturally form a part of the alternative line above described.

There can be no doubt that a navigable route from the Saint John's River to Charlotte Harbor would form a prominent and important feature in any scheme contemplating the development of Southern Florida. It is known that tropical and semi-tropical products and fruits and marketable vegetables of many kinds, and of excellent quality, can be raised here at a profit in abundance, and that extensive and valuable timber land exists in this region. Large tracts of very rich and productive soil would be rendered accessible to settlers by a suitable water-route, and vast areas of perhaps not less valuable land would doubtless be reclaimed by the construction of a canal.

Much activity has of late years been shown in the development of the railroad system in Florida, with an evident tendency of extending it southward. The South Florida Railroad from Sanford on Lake Monroe to Orlando, has lately been extended to Kissimmee City, at the north end of Tohopokeliga Lake. A south branch of the Atlantic, Gulf and West India Transit Railroad now reaches Ocala and is designed to connect with Tampa Bay.

Several lines of railroad are projected to run southward, notably one line proposed to run all along the eastern coast of Florida as far south as Saint Lucie at Indian River Inlet, and several lines are designed to reach Charlotte Harbor; other lines are to be constructed for transit across the State from east to west.

A company has lately been chartered by special act of the legislature of the State of Florida for the purpose of purchasing and improving certain tracts of land in Florida, the building of canals and other lines of transportation, and for other business. It has a concession for the reclamation of all the land lying south of township twenty-four and east of Peace Creek. This vast tract of land embraces all the territory covered by the recent survey, except Peace Creek and the Lower Caloosahatchie.

The company proposes to open channels from Okeechobee Lake to the Saint Lucie River on the east and to the Caloosahatchie on the west, not only for the purpose of permanently lowering the water level of the lake and reclaiming a large area of land thereby, but also to secure means of transportation for the products of the Kissimmee Valley and the sur-

rounding country. They have likewise, it is claimed, acquired the franchise for constructing canals for navigation, connecting the Saint John's River near its mouth, by way of Pablo Creek, with all the rivers, lakes, and lagoons situated on and parallel to the east coast of Florida, as far south as Lake Worth.

From information lately obtained they have been for some time dredging in the Caloosahatchie, and have almost reached Lake Hikpochee. A powerful steam dredge is said to have been built on Tohopokeliga Lake to open cuts down to Kissiminee Lake, and another cut to connect Tohopokeliga Lake with Little Tohopokeliga Lake, expecting thereby to reclaim many thousands of acres of swamp-land for agricultural uses.

In view of this private enterprise, which may be followed by others, it might perhaps be well to await the development of these schemes, before the general government takes further steps in regard to the establishment of a steamboat route across Southern Florida.

If it should be desired by Congress that further investigations be made with a view of more definitely settling the questions of the feasibility and cost of such a route, it is recommended that the following lines should be regularly surveyed:

1. A through line from Lake Poinset to the headwaters of the Saint John's River; thence to Taylor's Creek, or Cow Creek, through Okeechobee Lake, and down the Caloosahatchie to its mouth.

2. A check line from a convenient point of the first line to the Atlantic Ocean.

3. A line from Lake Washington via Lake Marianna to Kissimmee Lake, down Kissimmee River to a point about 50 miles below Fort Kissimmee, thence across to Istokpoga Lake to the head of Fisheating Creek, and to the mouth of Peace Creek via Trouteating Creek.

The cost of these operations, including a number of borings and diggings and miscellaneous examinations, is estimated at $25,000.

It may be remarked that it will be much less difficult to find a suitable line with a limited number of locks, than one without any locks; and that a few locks cannot be considered as causing a serious obstruction to navigation by delay, on a canal that may have a length of from 150 to 200 miles.

The northern part of the route surveyed is located in the collection district of Jacksonville, Fla., the southern part in the collection district of Key West, Fla. Statistics furnished by the collectors at these ports are given in Assistant Williamson's report.

Besides a general map showing the lines surveyed or examined, and proposed to be surveyed if an appropriation should be made for that purpose, special sheets are forwarded showing plans and longitudinal sections of the lines run east of Tohopokeliga Lake, and immediately west of Kissimmee Lake, and referred to in this report, showing the impracticability of a water route without locks in that section of the country.

The following papers are transmitted herewith:

1. Report of Assistant W. G. Williamson.
2. General map showing lines examined.
3. Map and profile of survey from Lake Winder to Tohopokeliga Lake.
4. Map and profile of survey from Kissimmee Lake to Peace Creek.

Very respectfully, your obedient servant,

Q. A. GILLMORE,
Lieutenant-Colonel of Engineers, Bvt. Maj. Gen'l, U. S. A.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

REPORT OF MR. W. G. WILLIAMSON, ASSISTANT ENGINEER.

RICHMOND, VA., *April*, 1882.

GENERAL: I have the honor to submit the following report of the survey "for the opening of steamboat communication from Saint John's River, Florida, by way of Tohopokeliga Lake to Charlotte Harbor or Peace Creek."

Mr. George Daubeney, who had been selected to conduct the survey, having lost his father, resigned, and by your order I relieved him on the 19th of March, 1881, at Orlando, Fla. He then turned over to me his instructions, and the two field parties, with their equipments.

The first party, under Mr. John Gartland, had been in the field some time (I think about twenty-eight days). The other party, under Mr. J. Fras Le Baron, was on its way to Lockapopka, the point at which the survey intrusted to it was to commence.

The first party had finished a line from Alligator Lake to Lake Winder, and also lines connecting Alligator Lake with Lakes Isabel, Little Tohopokeliga, and Tohopokeliga, and was engaged running a line of levels from Tohopokeliga Lake to Lake Kissimmee below Fort Gardner. After reaching the Kissimmee this party was to continue its line to the mouth of Tiger Creek, thence by a chain of lakes and creeks to Peace Creek at or near Fort Meade.

The line to be run by the second party, as directed by Mr. Daubeney, was to commence at Lockapopka, and run by a chain of lakes to the head of Big Charleypopka Creek; thence, via the latter creek, to Peace Creek. The same party was also directed to examine Peace Creek to its entrance into Charlotte Harbor. Both parties were allowed to continue their lines until I could overtake them, and examine the country with a view to ascertaining whether any changes in Mr. Daubeney's order were necessary.

As soon as I learned from Mr. Daubeney his ideas, and acquired the information he had obtained, I made arrangements to go down the Kissimmee River in a boat.

Starting at the head of Tohopokeliga Lake, I left Orlando on the 25th of March, and, taking a small boat, with three men, I examined the Tohopokeliga Lake, the Kissimmee River connecting it with Little Cypress Lake, the Little Cypress, and the Kissimmee River connecting the latter with Lake Cypress, or Hatchinneeha. I then examined Hatchinneeha and the Kissimmee River below it as far as Fort Gardner. At Fort Gardner I joined Mr. Gartland's party, spent a few days with him, and then went to look up Mr. Le Baron's party. After giving both parties instructions, I returned to Orlando for the purpose of mailing my pay-rolls and getting funds to pay the parties for the month of March.

Returning to Fort Gardner, I continued my examination of the Kissimmee River and the Kissimmee Lake as far as Fort Kissimmee, where the road from Fort Meade to Fort Drum crosses the river. I was obliged to stop my reconnaissance here, as both parties needed money, and the men were becoming dissatisfied. There was no way of communicating with the parties, except by traveling in carts or on horseback, and this necessitated two or three weeks' travel.

I directed Mr. Gartland to continue his line from the mouth of Tiger Creek, via Tiger Lake, We-shy-a-kapa-oha-kou-kou-hee, Lake Buffum, and Bowlegs Creek, to Peace Creek, about 2¼ miles below Fort Meade, as I found a direct line from Lake Buffum to Fort Meade would pass over high sand-hills, and be entire impracticable. I changed Mr. Le Baron's orders so as to dispense with lines connecting Istokpoga Lake, and a chain of small lakes northwest of it, with the Big Charleypopka Creek. Mr. Gartland was directed to connect his levels with those of Mr. Le Baron at Lockapopka.

As soon as Mr. Gartland finished his line, and ran the levels from the mouth of Bowlegs Creek to Fort Meade, establishing a "bench-mark" there, his party was disbanded, and he was ordered to New York to make his maps and profiles.

Mr. Le Baron had not finished his line, and I hoped to be able to take his party from the mouth of Peace Creek, through Charlotte Harbor, up the Caloosahacthie, and into Okeechobee Lake; thence to the head of the Saint John's River, as my observation of the country east of the Kissimmee, as well as information obtained from citizens familiar with it, led me to believe that the lowest ground between the Saint John's River and the Kissimmee, or Okeechobee, was either via Taylor's or Cow Creeks, across the ridge upon which Fort Drum is situated.

The appropriation was so nearly exhausted by the time this party had reached Lake Flirt, on the Caloosahatchie, that I was obliged to recall it.

As a canal with locks was not contemplated, but a through cut from the Saint John's to Charlotte Harbor, or Peace Creek, via Tohopokeliga Lake, the surveys which had been made were sufficient to prove the undertaking impracticable. The lines referred to connected the Saint John's with both Peace Creek and Charlotte Harbor, via Tohopokeliga Lake, which fulfilled the requirements of the act, and the information obtained, as well as my personal observation of the country south of these lines, convinced me that the only remaining line was by the Caloosahatchie River.

Mr. Meigs's survey in 1879 demonstrated that locks would be required to rea h the

Okeechobee from Charlotte Harbor by way of the Caloosahatchie. He found Lake Hikpochee 2,194 feet above mean low-tide at Fort Myers. He thought this lake on the same level as Okeechobee. We may rest assured it is not higher, and there can be no doubt that it will require locks to overcome this difference of level, especially at low-water, unless we intended cutting from the Atlantic to the Gulf a clear cut, regardless of expense.

But I am discussing a "steamboat route," and not a canal.

I will now show, by reference to the maps and profiles, that a route without locks, via Topopokeliga Lake, is impracticable.

Commencing at Lake Winder, the present terminus of steamboat navigation on the Saint John's River near Fort Taylor and Hardie's store, at an elevation by our levels above high-tide at Charlotte Harbor of 18.737 feet, the line skirts the lake until it strikes Wolf Creek, which it follows to its head, a distance of 10.11 miles, reaching an elevation of 61.989 feet, or 43.25 feet above Lake Winder, an average rise of 4.27 feet per mile. From the head of Wolf Creek it passes through cypress swamps and low-lying grounds to Alligator Lake, 16.94 miles; and this lake we find 9.49 feet above the head of Wolf Creek, and 52.74 feet above Lake Winder.

At points between Alligator Lake and the head of Wolf Creek the ground is 60 odd feet above Lake Winder. From Alligator Lake two lines were run to Tohopokeliga Lake, one via Lake Isabel and Little Tohopokeliga, and another more direct and nearly west to the lower end of Tohopokeliga, which is 45.85 feet above Lake Winder and 64.593 above Charlotte Harbor. By the first and most northern line through Isabel Lake, the distance is as follows: Across Alligator Lake, 1.35 miles; thence to Isabel, 2.01 miles, which may be reduced to 0.8 mile; across Isabel, 1 mile; from Isabel to Little Tohopokeliga, 1.11 miles; across Little Tohopokeliga, 4.8 miles; from Little Tohopokeliga to Tohopokeliga, 4.36 miles, which may be reduced by following Cross Prairies Creek to 3.6 miles. We have then the distance from Lake Winder by the line to Tohopokeliga Lake, 41.68 miles, which may be reduced by more direct routes over lower grounds to 39.71 miles.

Lakes Isabel, Little Tohopokeliga, and Alligator are so nearly the same level that they might be connected and used as a summit level.

The fall from Little to Big Tohopokeliga is 6.21 feet. The ground between Alligator and Tohopokeliga, via Isabel and Little Tohopokeliga, presents no difficulties to connecting these lakes, in fact Cross Prairies Creek connects the two Tohopokeligas now, and might be easily dredged and cleared of lillies and bonnets, so as to give from 5 to 8 feet navigation. If, however, the other lakes should be used as a summit level, it would become necessary to put a lock between Little and Big Tohopokeliga.

The other and more direct route referred to from Alligator Lake west to Tohopokeliga passes over higher ground a distance of 4.85 miles, and a canal would necessitate an average cut of not less than 18 feet, but it would save 9.61 miles in distance over the reduced route and 14.28 miles over the line as run via Isabel and Little Tohopokeliga. By putting a lock at the entrance of the canal to Tohopokeliga the lakes above might be used as reservoirs and connected with the canal by feeders.

It is evident that locks would be required in getting from Lake Winder to the summit level at Alligator Lake, or to Lake Tohopokeliga. To go lower down, and strike Canoe Creek, which flows from Alligator Lake to Little Cypress Lake, would not be complying with the act, which makes Tohopokeliga Lake a point in line, nor could that be done without locks, as Little Cypress is but very little lower than Tohopokeliga. From the Tohopokeliga we can easily pass without locks to the Okeechobee Lake through the Kissimmee River, and a series of large lakes which really constitute a part of the Kissimmee River. This Kissimmee River is very crooked, and to pass boats drawing even 2 feet during the dry season would require clearing out and dredging.

There is a small boat drawing about 2 feet now on the Kissimmee River which goes from the Tohopokeliga Lake to the Okeechobee Lake. The act requires us to go to Charlotte Harbor, or Peace Creek, and while we could go through the Okeechobee via the Caloosahatchie River to Charlotte Harbor we would not utilize Peace Creek, as seems to be the intention of the act.

It was necessary, therefore, to look for a line to Peace Creek, and to that end Mr. Gartland was required to leave the Kissimmee at the mouth of Tiger Creek, and continue his line, as before mentioned, to the mouth of Bowlegs Creek, 2¼ miles below Fort Meade on Peace Creek; and Mr. LeBaron was required to explore the country south of Mr. Gartland's lines in order to discover whether the chain of lakes existing there, taken in connection with the Big Charleypopka, might not prove better ground and afford more water. I will therefore continue the description of Mr. Gartland's line, and then Mr. LeBaron's line from the point it diverges to strike Big Charleypopka.

So far, we have followed the line from Lake Winder to a point where the Kissimmee River leaves Lake Tohopokeliga. By the first and most northern line, as the survey went, the distance would be 52.98 miles, which could be reduced to 48.31 miles.

By the second line, directly from Alligator Lake to the same point, we have a dis-

tance of 38.7 miles. We now follow the Kissimmee River 5.83 miles to Little Cypress Lake, and find the river very crooked, at points narrow and shallow while at others it is deep. It will average between 5 and 6 feet in depth. Across Little Cypress is about 3 miles, and the depth varies from 4 to 8 feet, as far as I could sound it.

The weather was so stormy when I crossed it that it was impossible to get soundings on the center of the lake. My guide informed me there was from 15 to 20 feet water in the center; and I expect there was.

From Little Cypress to Big Cypress, or Hatchinneeha, is about 5 miles, and the river is a much better stream than it is above, varying in depth from 4.5 to 10 feet. Across Hatchinneeha is about 3.5 miles. We crossed this lake in a storm, and were driven ashore a mile from the point we wanted to make, and could not take soundings. It is a very large lake, and I should think varied from 3 to 15 feet in depth.

From Hatchinneeha to the Kissimmee Lake is about 5 miles, and the soundings varied from 7 to 12 feet. This part of the river is very crooked, and would require straightening. Across the Kissimmee Lake to the mouth of Tiger Creek is 2.66 miles. This lake varies in depth from a few inches close to shore to 19 feet in the channel. I sounded it from one end to the other on the 29th of April, 1881. It is at least 15 miles long. We have fallen from Tohopokeliga Lake to the mouth of Tiger Creek, in the Kissimmee Lake, 5.9 feet, and are 39.9 feet above Lake Winder. Passing on via Tiger Creek to Tiger Lake 1.99 miles, we rise 0.72 feet; thence across Tiger Lake 2.25 miles, to Walk-in-the-Water 3.26 miles, we rise 8.55 feet above Tiger Lake. Crossing Walk-in-the-Water 3.6 miles, we continue via Tiger Creek and its western prong to Lake Lenore 6.55 miles, and rise 24.16 feet above Walk-in-the-Water.

Crossing Lake Lenore 1.1 miles, and reaching Little Tiger Lake in the distance of 0.42 miles, we rise 7.55 feet; thence 1 mile across Little Tiger and over sand hills sixty-odd feet above little Tiger for 1.95 miles, we reach Crooked Lake, 32.42 feet above Little Tiger and 113.34 above Lake Winder. We leave Crooked Lake after traversing it 1.6 miles and pass across comparatively high ground for 2.85 miles to Lake Buffum, 6.18 feet above Crooked Lake, 119.52 feet above Lake Winder, and 138.265 feet above high-tide at Charlotte Harbor. Lake Buffum is the summit lake on this line, which continues across the lake 1.6 miles, and via Bowlegs Creek to Peace Creek, 15.05 miles, and falls below Lake Buffum 65.125 feet. At this point Peace Creek is 54.4 feet above Lake Winder, and 73.14 feet above high-tide at Charlotte Harbor.

It is very evident that locks would be required over the last portion of the line described from Lake Kissimmee to Peace Creek, as well as over the first portion from Winder to the Tohopokeliga Lake. A simple reconnaissance of Peace Creek is sufficient to show that both locks and dams would be necessary to make Peace Creek navigable to Charlotte Harbor all the year round. In addition to locks and dams, it would require a great deal of work to straighten Peace Creek so that boats could navigate it, even if there was a sufficiency of water.

Peace Creek falls from the mouth of Bowlegs Creek to the mouth of the Big Charley-popka 56.42 feet according to Mr. Le Baron's levels, a distance of 43.82 miles, an average fall of 1.28 feet per mile. From the mouth of Big Charleypopka to Live Oak Point it falls 16.72 feet, a distance of 51.54 miles, or an average of 0.32 feet per mile.

I think it is very clear that locks would be required on this route from Lake Winder to Live Oak Point. Let us now go back on Mr. Gartland's line to Crooked Lake and see what sort of a line we can get by following Mr. Le Baron's survey. First, we cross Crooked Lake, traversing it only 1 mile, and then passing over a sandy ridge 0.94 miles, we descend from the level of Crooked Lake (132.083) to the level of Locakpopka (116.63) 15.45 feet. From Lockapopka to Lake Livingstone, a distance of 4.09 miles, we fall 25.1 feet. From Lake Livingstone to the divide between it and the head-waters of Big Charleypopka (Old Town Swamp, the middle prong) we rise 42.48 feet in 2.74 miles, attaining an elevation only 4.25 feet lower than Lake Buffum, and without the supply of water at this summit, which Lake Buffum at the other summit would afford.

From the divide to Peace Creek at the mouth of Big Charley, we fall 117.29 feet, following the Old Town Swamp and the Big Charley all the way, and finding in the dry season little or no water the greater part of the distance. After reaching Peace Creek at the mouth of the Big Charleypopka, we continue, as before described, down Peace Creek to its mouth at Live Oak Point, in Charlotte Harbor, falling only 16.72 feet. Mr. Le Baron says of the Big Charleypopka, that he ran his line down the creek, first on one side and then on the other, until he reached High Ford, when he followed the west bank, taking levels, whenever the line crossed, of the swamp and sections of the water. English Ford, he says, was dry, and only 2 or 3 inches of water at High Ford.

Between English Ford and the mouth of North Prong the channel was dry in many places, with occasional pools of deep water. "The combined waters of Old Town Swamp and the North Prong only made a small rivulet of about 5 feet in width, by 2 or 3 inches in depth." "At times of excessive flood, the whole country for many miles

on each side has been overflowed." The South Prong, Mr. Le Baron says, "is evi dently of greater volume than the main creek, for after the accession of its waters, the creek becomes, and continues of respectable size, with a steady current." At Whidden's Ford, Mr. Le Baron says, the water was only 0.6 foot deep May 8, 1881, but that he saw evidence of its having been from 19 to 20 feet above that level. All this only goes to show that it might be possible, at great expense for storage reservoirs, to build a small canal with many locks, and that a steamboat route without locks is impracticable.

I passed through Charlotte Harbor, from Live Oak Point to Punta Rassa, several times, made notes and observations which satisfied me that the United States Coast and Geodetic Survey chart would enable an engineer to decide upon the best entrance to Charlotte Harbor for a canal, and would also enable him to make a pretty close estimate of the amount of dredging that would be required. I also examined the Saint John's River, from Sanford to Lake Winder, and found it extremely crooked, and in some few places quite shoal; I consider it, however, capable of being made navigable for boats drawing from 4 to 5 feet of water, and perhaps more.

The levels taken by Mr. Gartland of Lochapopka and Reedy Lake, show that Reedy Lake is 32.25 feet below Lochapopka, and only 16.44 feet above Walk-in-the-water Lake. This would suggest the propriety of leaving Mr. Gartland's line at Walk-in-the-water, and approaching Peace Creek via Reedy Lake. We find, however, sand hills intercepting us on this route, and after we get to Reedy Lake we have a greater ascent to the divide between Lake Livingstone and the Big Charley than we have from Lochapopka.

The only southern outlet Walk-in-the-water Lake has, is a swamp called "Blue Jordan," which connects it with Istokpoga at high-water, and thence flows to the Kissimmee.

The impracticability of a through cut from Saint John's River to Charlotte Harbor, on Peace Creek, via Tohopokeliga Lake is, I think, demonstrated.

The information obtained by the surveys will be of great service in indicating lines of improvements. While the enormous expense a through cut would necessitate is shown, the practicability of building cheap canals for small boats is clearly proven. It has suggested to my mind the improvement of the Kissimmee River, which seems so feasible that it will not be long before private capital will embark in it.

The railroad, which is being extended from Orlando to Tohopokeliga Lake, will connect the Saint John's and the Kissimmee. All that will be required for a few years is two or three light-draught boats to run from Tohopokeliga to Okeechobee. The number of these boats may be increased as commerce demands, and by building two or three locks on the Caloosahatchie, communication is secured with Punta Rassa, Charlotte Harbor, and the Gulf of Mexico at comparatively small cost.

But that is not all the information suggests, for in demonstrating the fact that a route without locks is impracticable, it indicates where to look for the route with fewest locks.

By referring to the map you will observe that the Saint John's has its source within 48 miles of Lake Okeechobee; that the heads of creeks which flow into the Saint John's and Okeechobee are much closer together. Mr. Le Baron says, "of this distance (48 miles) 36 miles, or the whole of six townships, is through morasses so boggy and low that the United States land surveyors were unable to penetrate them to subdivide them, and they reported them as impassable."

All the maps agree in representing that country as low, flat, and interspersed with lakes, ponds, lagoons, and saw-grass prairies. The Saint John's flows nearly due north, while the Kissimmee flows nearly due south. In short, the planes of the two streams must intersect, if prolonged south. And the question to be decided is not where they do intersect, but where they come nearest to each other.

This idea was suggested to me by Colonel Allen, a graduate of West Point, living in Florida, and struck me at the time as well worth bearing in mind.

The better I became acquainted with the topographical features of the country, the more satisfied I was that the suggestion was good, and, if kept in mind, might lead to valuable information.

For the purpose of finding where the planes of these two streams approached each other nearest, I was very anxious to connect the Saint John's with the Okeechobee by a line of levels. The want of means forbade my carrying out this project. But the levels I have, if correct, will approximate the truth, when combined with those of Mr. Meigs's survey of 1880. Mr. Meigs makes Lake Okeechobee (or Hickpochee, which he thinks is the same level), 21.94 feet above mean low-tide at Myers, Fla. Mean high-tide, the base Mr. Le Baron has reduced his level to, is about 1.7 feet above mean low-tide, therefore Lake Okeechobee, when reduced to our base, is 20.24 feet above mean high-tide in Charlotte Harbor, supposing tides at Live Oak Point and Myers are the same level. Now Lake Winder is only 18.74 feet above this same base, therefore Lake Okeechobee is only 1.5 feet above Lake Winder. In an air line Lake Okeechobee is by the maps 72 miles south of Lake Winder, so that the headwaters of the Saint

John's, Lake Washington, and the saw-grass ponds south of it, must be nearly the same level, if not higher than Okeechobee. If these levels are correct, there would be no difficulty in connecting the Saint John's River with the Okeechobee by a clear cut. In fact, a clear cut might be made with a much greater difference of level.

The only locks, then, which would be required would be from Okeechobee to Myers, via the Caloosahatchie, and we would require two or three locks to overcome the 21.94 feet ascent in the Caloosahatchie. It is possible, though I do not think it probable, that one lock might suffice to overcome this difference of level. Information gathered from citizens familiar with the country, and my own observations east of the Kissimmee, coupled with Mr. Le Baron's report, and observations on other surveys in that vicinity, lead me to believe the last route suggested, from the head of the Saint John's, via either Taylor's or Cow Creek to the Okeechobee, is the most practicable and cheapest route that can be had. I am inclined to think the line should go to the east of Fort Drum and down Cow Creek to the Okeechobee. I am told the waters of the Saint John's and the Okeechobee at high-water during the rainy season are separated for only a short distance, and by a very low ridge. This ridge is an extension of the divide between the Kissimmee and the Saint John's. By referring to the military map of Florida you will find that east of Forts Drum, Lloyd, and Van Swearingen the land is low and swampy, with numerous small streams running in almost every direction. You will also notice that near Fort Van Swearingen and the head of Cow Creek the ridge is very narrow and not well defined. This corresponds with the statements of citizens familiar with that country. There seems to be very good reason to suppose that our levels are not very far out, although it cannot be expected that a single line of levels without test lines would be exactly correct.

While I am not expected to report on a ship canal, I hope an idea which suggests itself in that connection will not be out of place in this report. It is that a ship canal might be cut from Saint Lucie, or some point near it, through Okeechobee, via Caloosahatchie, to Charlotte Harbor and the Gulf, more easily than between any other points on the Atlantic and Gulf coasts of the State of Florida.

The distances would be as follows: From Saint Lucie to the mouth of Cow Creek, by canal 33 miles; thence across Okeechobee 38 miles, and down the Caloosahatchie 63.78 miles to its mouth. This canal might be built with locks, but if it were made a clear cut it would not have a cut on it equal to some of the cuts of the Suez Canal. Of course it would be expensive, and I merely mention these ideas as they suggest themselves in connection with my surveys.

In regard to the commercial advantages of this steamboat route, it is very hard to form an idea of the freight which would seek it. If it was a ship canal the advantages might be more readily compared with the cost. But it is to be a steamboat route, and the inference from the words of the act is that boats drawing only 3 or 4 feet are to be provided for.

Your report on the canal from Saint Mary's to the Gulf of Mexico shows clearly enough the advantages of a ship canal. But in this instance the vessels which would use the route would depend largely on local freights, as they could not go to sea. This route, however, would open up a portion of South Florida, which at present has no transportation facilities, and which is very productive, or capable of being made so. Lands now lying idle and unoccupied would be made accessible and thrown on the market and be readily sold. Some of these lands thus made available would produce not only the semi-tropical fruits and all kinds of vegetables, but also as fine sugar as any lands in the United States, as the cane is never injured by frost, and will grow for two or three years without being replanted. Sugar lands contiguous to the canal might be improved by drainage.

The principal articles which would furnish freight for the canal are as follows:

Fruits.—Bananas, pine-apples, oranges, lemons, limes, guavas, strawberries, figs, grapes, and melons.

Market vegetables.—Cucumbers, tomatoes, sweet potatoes, cabbages, turnips, beets, pease, and others too numerous to mention, as I believe any sort of vegetable will grow in Florida.

Beef cattle, live stock, and lumber.

General merchandise.—A large proportion of the above-mentioned articles would be sent out of the State, while articles of general merchandise would be returned.

The cultivation of fruits and vegetables for market is increasing rapidly.

I believe Southern Florida is much better adapted to the growing of semi-tropical fruits than Middle or Northern Florida. I saw growing at Fort Myers cocoanuts, dates, limes, lemons, oranges, alligator or avocado pears, mammee sapota, sapotilla, guavas, pine-apples, and other fruits which I cannot now recall, yet they are not shipped, because the only outlet to the market is south, and to ship fruit south would be like sending coal to Newcastle. The consequence is, little or no attention is given to these products in this part of the State, where they grow best. The people are mostly engaged in raising cattle for the Cuban market.

I append table of distances and levels, showing the distances from Lake Winder, by the line surveyed, to Peace Creek and Charlotte Harbor, and also the distances, as measured on the map from Lake Winder, via the proposed line to Okeechobee and down the Caloosahatchie to its mouth.

The northern end of this route is in the collection district of Jacksonville, Fla.; the southern terminus is in the collection district of Key West, Fla.

I append:

1st. Statement of Mr. F. N. Wicker, collector at the port of Key West, of the revenue collected at that port from customs, tonnage, and hospital dues from July 1, 1879, to June 30, 1880; also a statement of the number and value of cattle and hogs exported from the same port.

2d. Statements of Mr. Edwin Higgins, deputy collector of the port of Jacksonville, Fla.: No. 1. Showing tonnage of vessels doing business on the Saint John's River June 30, 1881, which do not enter or clear from Jacksonville; United States vessels entered and cleared, coastwise and for foreign ports. No. 2. Showing foreign vessels cleared, and for foreign ports, also value of exports and imports, and the amount of duties collected.

I also append tables Nos. 1, 2, 3, 4, 5, 6, and 7, giving distances and elevations on the different lines, and the rainfall at Punta Rassa.

Two maps made by Mr. John Gartland, showing the routes he surveyed, accompany this report, and I have marked on the tracing in red ink the route surveyed, and the one I suggested as the most feasible route.

I wish here to express my thanks to Mr. John Gartland and Mr. J. Fras Le Baron for the manner in which they conducted their surveys, and also to merchants and citizens of Orlando, Fort Meade, Fort Ogden, and Fort Myers, for valuable assistance.

I am, very respectfully, your obedient servant,

W. G. WILLIAMSON,
Assistant Engineer.

Brevet Maj. Gen. Q. A. GILLMORE,
Lieutenant-Colonel, Corps of Engineers, U. S. A.

N. B.—I have retained the spelling of the names of lakes as they are given on the military maps and maps furnished from Washington, because I suppose the Army officers who made these maps were better prepared to give the correct spelling than any one now could be, as they evidently tried to spell them as the Indians then called them, whereas now we find them spelled in many different ways on modern maps, every surveyor adopting his own idea of the proper way of spelling. *Peace Creek* is, I think, correctly spelled, and should not be spelled Pease Creek (*vide* Le Baron).

W. G. W.

Statement of the revenue collected at the port of Key West, Fla., from customs, tonnage, and hospital dues, from July 1, 1879, to June 30, 1880.

Months.	Duties.	Hospital dues.	Tonnage.	Total.
1879.				
July 31	$10,025 41	$342 70	$266 70	$10,634 81
August 31	8,786 37	248 21	106 05	9,140 63
September 30	6,333 11	287 01	204 60	6,824 72
October 31	12,210 45	231 10	36 19	12,477 74
November 30	23,932 60	183 52	941 27	25,057 39
December 31	23,705 70	139 49	193 82	24,039 01
1880.				
January 31	22,685 26	197 39	193 82	22,882 65
February 29	19,050 96	159 82	1,116 96	20,327 74
March 31	19,924 68	348 34	332 53	20,605 55
April 30	17,717 53	454 54	184 43	18,356 50
May 31	11,493 99	248 51	477 01	12,219 51
June 30	7,676 43	372 41	167 94	8,216 78
	183,542 49	3,213 04	4,027 50	190,783 03

NUMBER AND VALUE OF CATTLE EXPORTED FROM THE PORT OF KEY WEST DURING THE FISCAL YEAR ENDING JUNE 30, 1880.

Number of cattle, 29,548; value	$406,915
Number of hogs, 152; value	1,186
Total	408,101

F. N. WICKER, *Collector.*

CUSTOM-HOUSE, *Key West, Fla., June* 24, 1881.

LETTER OF COLLECTOR OF CUSTOMS AT JACKSONVILLE, FLORIDA.

CUSTOM-HOUSE, COLLECTOR'S OFFICE,
Jacksonville, Fla., June 21, 1881.

SIR: I forward statistics as requested by you; hope the information may be of service.

Respectfully, &c.,

EDWIN HIGGINS,
Deputy Collector.

W. G. WILLIAMSON, Esq.,
United States Assistant Engineer.

TONNAGE OF VESSELS DOING BUSINESS ON THE SAINT JOHN'S RIVER JUNE 30, 1881, WHICH DO NOT ENTER OR CLEAR FROM JACKSONVILLE.

	Number.	Tonnage.
Sail vessels	6	124.85
Steam vessels	33	2,922.29
Total	39	3,047.14

Year ending June 30, 1881: United States vessels entered coastwise, 384; tonnage, 168,659; men, 4,618. United States vessels entered from foreign ports, 21; tonnage, 3,754; men, 140. Foreign vessels entered from foreign ports, 9; tonnage, 743; men, 58. United States vessels cleared coastwise, 384; tonnage, 169,740; men, 4,599. United States vessels cleared for foreign ports, 31; tonnage, 6,252; men, 223.

TABLE No. 1.—*Table of distances and elevation of points along the line surveyed from Lake Winder to the Kissimmee River where it leaves Lake Tohopokeliga.*

Names of places.	Distances between stations.	Total distances from Winder.	Elevations above high-tide at Charlotte Harbor.
	Miles.	*Miles.*	*Feet.*
Lake Winder	0.00	0.00	18.737
Head of Wolf Creek	10.11	10.11	61.989
Alligator Lake, east side	16.94	27.05	71.484
Alligator Lake, west side	1.35	28.40	71.484
Isabel Lake, south end	2.01	30.41	71.804
Isabel Lake, north end	1.00	31.41	71.804
Little Tohopokeliga Lake, southeast corner	1.11	32.52	70.812
Little Tohopokeliga Lake, southwest corner	4.80	37.32	70.812
Tohopokeliga Lake, northeast corner	4.36	41.68	64.593
Tohopokeliga Lake, south end	11.30	52.98	64.593

The above distance, 52.98 miles, by following Cross Prairies Creek and straightening the lines at other points, may be reduced to 48.31 miles.

TABLE No. 2.—*Table of distances and elevations along the line surveyed from Lake Winder, via Alligator Lake, thence directly west to Tohopokeliga Lake.*

Names of places.	Distances between stations.	Total distances from Winder.	Elevations above high-tide at Charlotte Harbor.
	Miles.	*Miles.*	*Feet.*
Lake Winder	0.00	0.00	18.737
Head of Wolf Creek	10.11	10.11	61.989
Alligator Lake, east side	16.94	27.05	71.484
Alligator Lake, south end	3.40	30.45	71.484
Tohopokeliga Lake, southeast corner	4.85	35.30	64.593
Tohopokeliga Lake, exit of Kissimmee	3.40	38.70	64.593

TABLE No. 3.—*Table of distances from exit of Kissimmee River from Tohopokeliga Lake to the mouth of Bowlegs Creek or Peace Creek.*

Names of places.	Distances between stations.	Total distance from Tohopokeliga.	Elevations above high tide at Charlotte Harbor.
	Miles.	*Miles.*	*Feet.*
Tohopokeliga Lake, exit of Kissimmee	0.00	0.00	64.593
Cypress Lake	5.83	5.83	
Across Cypress Lake	3.00	8.83	
Lake Cypress or Hatchinneeha	5.00	13.83	60.235
Across Cypress or Hatchinneeha	3.50	17.33	60.235
Lake Kissimmee	5.00	22.33	59.063
Lake Kissimmee, mouth of Tiger Creek	2.66	24.99	58.668
Tiger Lake	1.99	26.98	59.384
Across Tiger Lake	2.25	29.23	59.384
Walk-in-the-water Lake	3.26	32.49	67.942
Across Walk-in-the-water Lake	3.60	36.09	67.942
Lake Lenore	6.55	42.64	92.104
Across Lake Lenore	1.10	43.74	92.104
Little Tiger Lake	0.42	44.16	99.655
Across Little Tiger Lake	1.00	45.16	99.655
Crooked Lake	1.95	47.11	132.083
Across Crooked Lake	1.60	48.71	132.083
Lake Buffum	2.85	51.56	138.265
Across Lake Buffum	1.60	53.16	138.265
Mouth of Bowlegs Creek	15.05	68.21	73.140
Live Oak Point, mouth of Peace Creek	95.36	163.57	00.000

TABLE No. 4.—*Table of distances of proposed line from head of Saint John's River to mouth of Caloosahatchie, via Cow Creek and Lake Okeechobee.*

Names of places.	Distances between stations.	Total distance from Winder.	Elevations above high tide at Charlotte Harbor.
	Miles.	*Miles.*	*Feet.*
Lake Winder	0.00	0.00	18.737
Mouth of Cow Creek	80.00	80.00	20.240
Across Okeechobee Lake	38.00	118.00	20.240
Hikpochee Lake	2.50	120.50	20.240
Across Hikpochee Lake	3.00	123.50	20.240
Sugarberry Hammock	3.50	127.00	.....
Fort Thompson	3.50	130.50	.....
Mouth of Caloosahatchie	51.28	181.78	00.000

The distances in the above table are estimated from the map, and taken from Mr. Meigs report of the survey of the Caloosahatchie.

TABLE No. 5.—*Table of distances from Crooked Lake, via Mr. Le Baron's line to Live Oak Point, Charlotte Harbor.*

Names of places.	Distances between stations.	Total distance from Crooked Lake.	Elevations above high tide at Charlotte Harbor.
	Miles.	*Miles.*	*Feet.*
Crooked Lake	0.00	0.00	132.083
Across Crooked Lake	1.00	1.00	132.083
Lochapopka	0.94	1.94	116.630
Across Lochapopka	0.50	2.44	116.630
Lake Livingstone	4.09	6.53	91.530
Across Lake Livingstone	2.25	8.78	91.530
Divide between Lake Livingstone and Old Town Swamp	2.74	11.52	134.010
Buckhorne Prong	15.45	26.97	55.930
Peace Creek, mouth of Big Charleypopka	17.93	44.90	16.720
Live Oak Point, Charlotte Harbor	51.54	96.44	00.000

By Mr. Gartland's surveyed line the distance from Winder to Crooked Lake is 100.09 miles. Adding the above 96.44, we have 196.53 miles by Mr. Le Baron's line; 191.86 miles by the reduced distances, Mr. Gartland's first line; 182.25 miles by the line from Winder to Alligator, thence direct to Tohopokeliga.

TABLE No. 6.—*Table comparing the different lines.*

1. Line from Lake Winder to Charlotte Harbor via Alligator Lake, Isabel Lake, Little Tohopokeliga, Tohopokeliga, &c., Bowlegs Creek and Peace Creek to Charlotte Harbor:

From Winder to exit of Kissimmee from Tohopokeliga	52.98
From Tohopokeliga to mouth of Bowlegs Creek	68.21
From Bowlegs Creek to Live Oak Point	95.36
	216.55

2. By the same route, reducing the distance surveyed by straightening the lines 48.31 + 163.57 = 211.88

3. By the second line from Winder to Alligator Lake, thence directly to the south end of Tohopokeliga:

The exit of Kissimmee	38.70
Tohopokeliga to mouth of Bowlegs Creek	68.21
Mouth of Bowlegs Creek to Live Oak Point	95.36
	202.27

4. By Gartland's line to Crooked Lake, and then by Le Baron's line to mouth of Big Charleypopka 196.53

By same reduced	191.86
By line from Winder to Alligator, and then direct to Tohopokeliga	182.25
By proposed line, Table No. 4	181.78

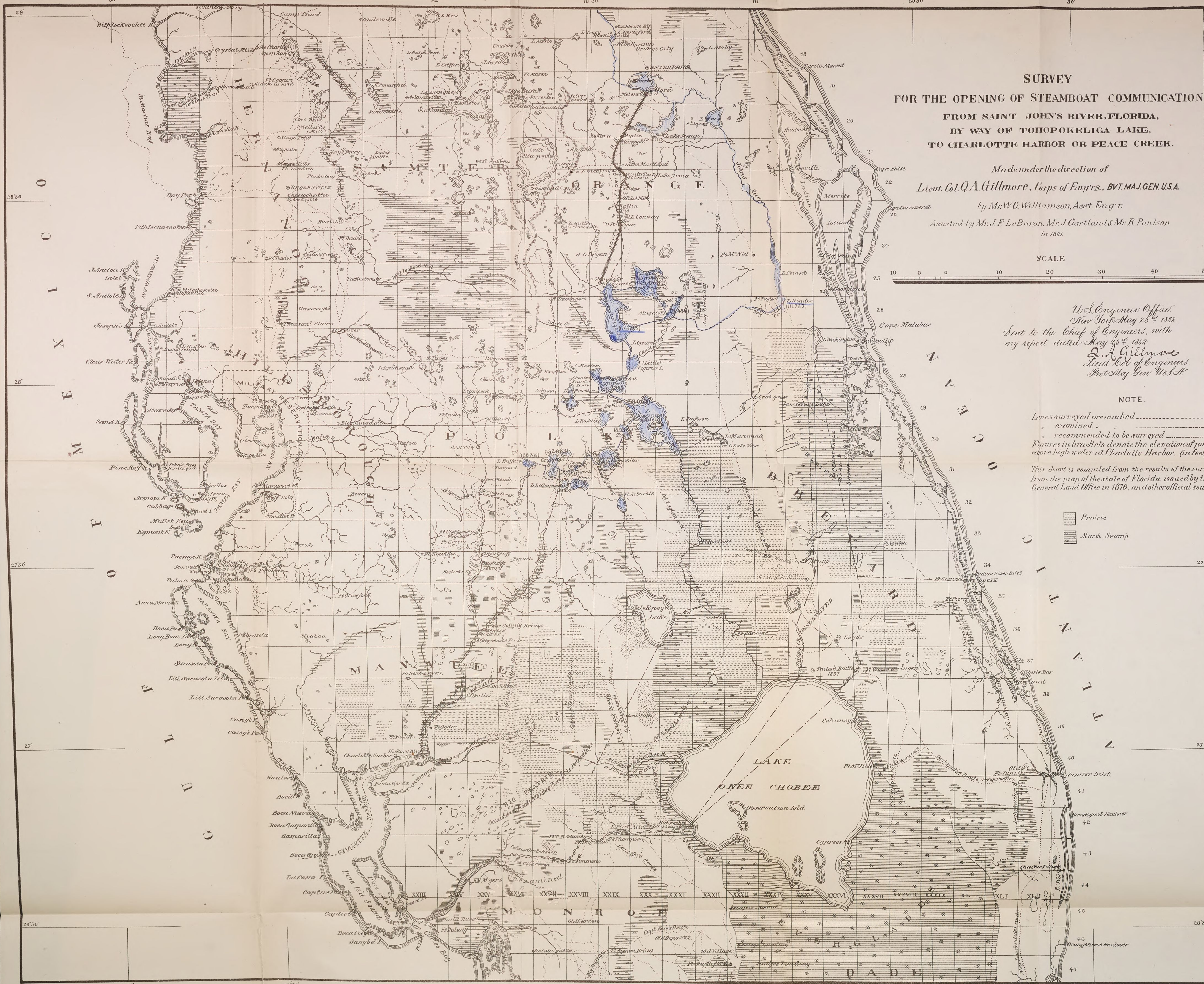
The line suggested as a ship-canal route would be 134.78 miles long, from Saint Lucie to mouth of Caloosahatchie 134.78

TABLE No. 7.—*Table showing amount of rainfall at Punta Rassa for the year* 1873 *to* 1880 *inclusive, and for each month of the year* 1881, *in inches and decimals of an inch, furnished by United States Signal Service, Mr. Evans, observer.*

	Inches.
1873	
1874	59.2
1875	38.16
	29.71

	Inches
1876	44. 3
1877	38. 9
1878	51. 8
1879	46. 2
1880	39. 5

Months.	1880.	1881.
	Inches.	*Inches*
January	3. 22	4. 0
February	1. 26	0. 5
March	0. 03	1. 1
April	0. 55	0. 5
May	5. 32	3. 1
June	2. 45	2. 5
July	3. 76	3. 6
August	8. 55	.....
September	2. 50	.....
October	8. 10	.....
November	1. 81	.....
December	1. 98	.....



SEN. EX. DOC. No. 189, 1st SESS., 47th CONG.

SURVEY FOR THE OPENING OF STEAMBOAT COMMUNICATION FROM SAINT JOHN'S RIVER, FLA., BY WAY OF TOHOPOKELIGA LAKE, TO CHARLOTTE HARBOR OR PEACE CREEK.

EASTERN SECTION,

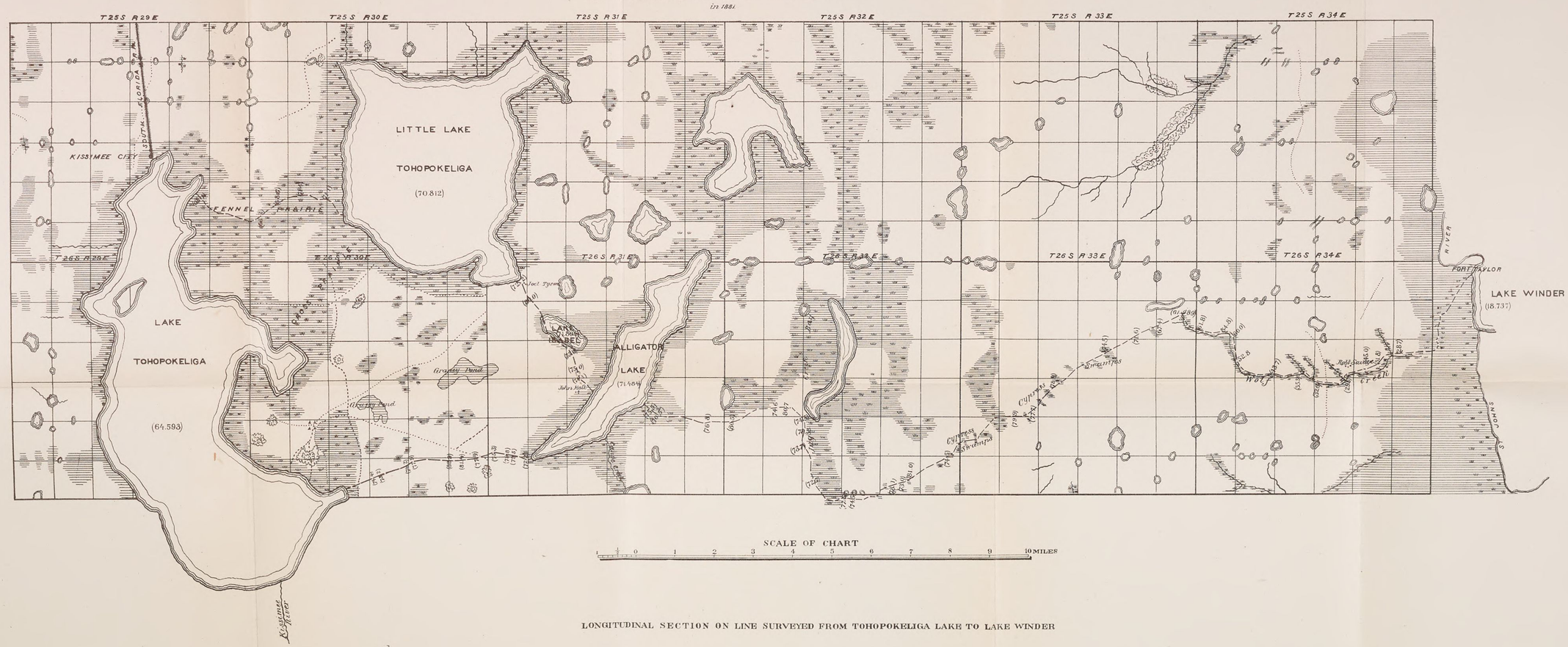
FROM LAKE WINDER TO TOHOPOKELIGA LAKE.

NOTE

Figures in brackets denote the elevation of points, in feet, above high water at Charlotte Harbor.

Made under the direction of
Lieut Col. Q.A. Gillmore, Corps of Engrs., BVT. MAJ GEN U.S.A.
by Mr W.G. Williamson Asst. Eng'r,
Assisted by Mr J.F. LeBaron, Mr J. Gartland & Mr R. Paulson.
in 1881

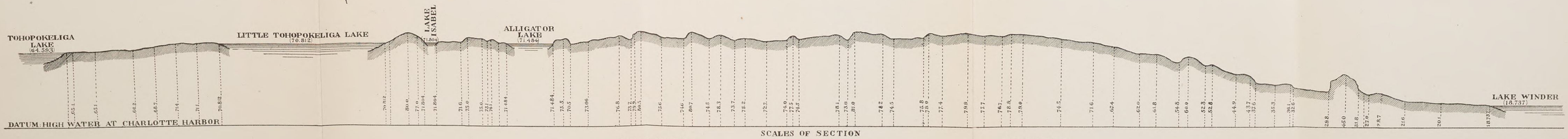
U.S. Engineer Office
New York May 23rd 1882.
Sent to the Chief of Engineers, with
my report dated May 23rd 1882.
Q. A. Gillmore
Lieut. Col. of Engineers
Bvt. Maj Gen'l U.S.A.



SCALE OF CHART

1 0 1 2 3 4 5 6 7 8 9 10 MILES

LONGITUDINAL SECTION ON LINE SURVEYED FROM TOHOPOKELIGA LAKE TO LAKE WINDER



SCALES OF SECTION

HORIZONTAL SCALE 1 0 1 2 3 4 5 6 7 8 9 10 MILES

VERTICAL SCALE 10 0 50 100 150 200 FEET

SEN. EX. DOC. No. 189, 1st SESS., 47th CONG.

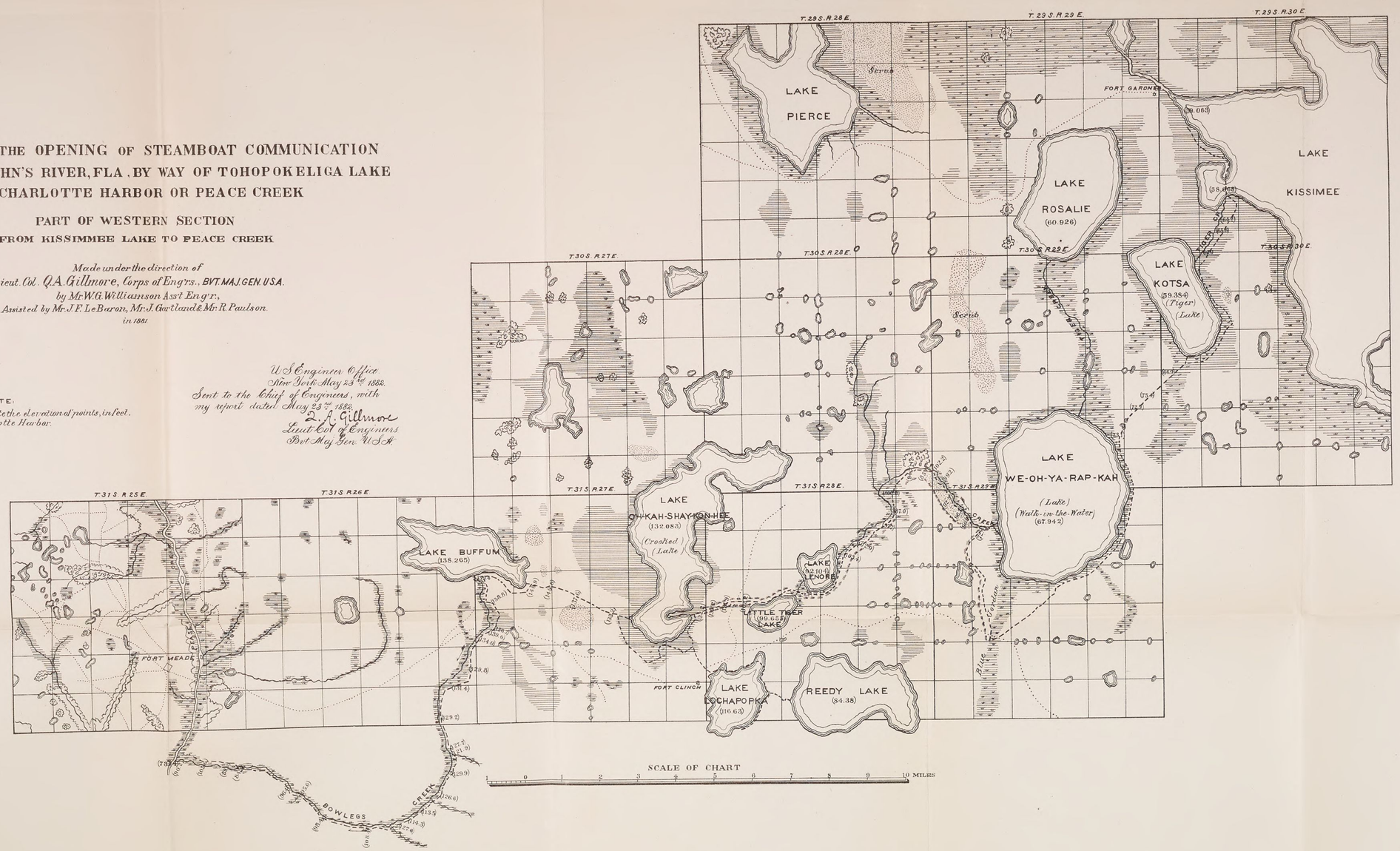
SURVEY FOR THE OPENING OF STEAMBOAT COMMUNICATION FROM SAINT JOHN'S RIVER, FLA., BY WAY OF TOHOPOKELIGA LAKE TO CHARLOTTE HARBOR OR PEACE CREEK

PART OF WESTERN SECTION
FROM KISSIMMEE LAKE TO PEACE CREEK

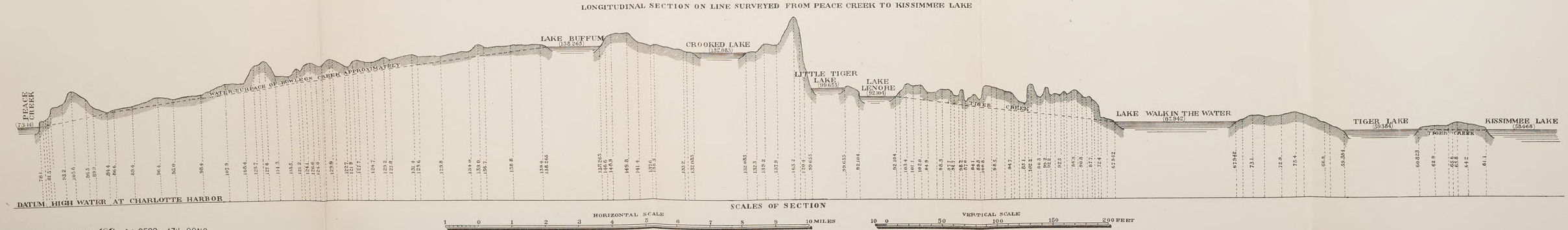
Made under the direction of
Lieut. Col. Q.A. Gillmore, Corps of Engrs., BVT. MAJ. GEN. U.S.A.
by Mr. W.G. Williamson Asst Engr,
Assisted by Mr. J.F. LeBaron, Mr. J. Gartland & Mr. R. Paulson.
in 1881

U.S. Engineer Office
New York May 23rd 1882.
Sent to the Chief of Engineers, with
my report dated May 23rd 1882.
Q.A. Gillmore
Lieut-Col of Engineers
Bvt Maj Gen. U.S.A.

NOTE.
Figures in brackets denote the elevation of points, in feet, above high water at Charlotte Harbor.



LONGITUDINAL SECTION ON LINE SURVEYED FROM PEACE CREEK TO KISSIMMEE LAKE



SEN. EX. DOC. No. 189, 1st SESS., 47th CONG.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 190.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A report from Capt. James Mercur, Corps of Engineers, upon an examination of Oregon Inlet, North Carolina.

JULY 6, 1882.—Referred to the Committee on Commerce and ordered to be printed.

WAR DEPARTMENT,
Washington City, July 5, 1882.

The Secretary of War has the honor to transmit to the United States Senate, for the information of the Committee on Commerce, a communication from the Chief of Engineers, of the 3d instant, and the accompanying copy of the report of Capt. James Mercur, Corps of Engineers, upon an examination of Oregon Inlet, North Carolina, made in compliance with requirements in the river and harbor act of March 3, 1881.

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT *pro tempore*
of the United States Senate.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., July 3, 1882.

SIR: In obedience to the requirements of section 3 of the river and harbor act of March 3, 1881, I have the honor to submit herewith the report of Capt. James Mercur, Corps of Engineers, giving the results of his examination of Oregon Inlet, in Dare County, in North Carolina.

Very respectfully, your obedient servant,

H. G. WRIGHT,
Chief of Engineers, Brig. & Bvt. Maj. Gen.

HON. ROBERT T. LINCOLN,
Secretary of War.

EXAMINATION OF OREGON INLET, DARE COUNTY, NORTH CAROLINA.

UNITED STATES ENGINEER OFFICE,
Norfolk, Va., June 29, 1882.

GENERAL: I have the honor to submit the following report upon the examination of Oregon Inlet, with which I was charged by Special Orders No. 120, dated Washington, Adjutant-General's Office, May 26, 1881.

A preliminary personal examination was made by me on June 22, with a view to a further instrumental survey, if it was considered desirable, and the funds available would permit it.

Oregon Inlet connects the ocean with the waters of Pamplico Sound to the eastward of the southern end of Roanoke Island. In its present condition it allows vessels drawing 9 feet to enter at low water, and those drawing 11 feet at high water. The entrance is well marked by the breakers on the bar and the beach when a moderate sea prevails, and one properly-located buoy would make it clear at most states of wind and sea. The width of channel between the breakers is about 500 yards. The channel at this time skirts the southern point of the inlet, following a line parallel to the beach, and enters the deep water in a direction nearly southeast, a little to the south of the life-saving station, which is very near the site of the old light-house which formerly stood to the south of the inlet.

After entering the inlet a vessel strikes the Old-house channel, which for about a mile carries more water than there is on the bar, and which affords a harbor of limited extent to vessels which may lie in it.

At the inner end of the Old-house channel lies the Bulkhead shoal, over which there is only about 5 feet of water, and the channel through this "bulkhead" or "swash" is extremely crooked. The bottom within, without, and through the inlet is composed of shifting sands, which move continually under the action of waves and currents, so that the resident fishermen are unable to work a boat drawing 4 feet across the bulkhead without constant sounding and kedging to find and follow the turns in the channel.

The channel over the outer bar is more constant in its character, but is liable to change in depth and direction at any storm. The local pilot informs me that at one time last winter there was a depth of 14 feet at low water for some time.

The latest available Coast Survey chart shows the condition of the inlet in 1873, at which date the channel skirted the northern point and opened almost due north, with a least depth on the bar of 6½ feet. An old steamboat-boiler which remains from a wreck in or near this old channel is now about one-third of a mile to the north of the present channel.

The extremely unstable nature of the bar, and the great extent, very small depth, and constant shifting of the shoals within would render any attempt at improvement at a small expense entirely futile, and would cause any improvement promising permanence to be enormously expensive.

No instrumental survey of any value could be executed with the limited amount of money available.

I remain, general, very respectfully, your obedient servant,

JAS. MERCUR,
Captain of Engineers.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

47TH CONGRESS. } SENATE. { EX. DOC.
1st Session. } { No. 191.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING

A report from Maj. Amos Stickney, Corps of Engineers, upon a survey of Pass Manchac and Bayou Manchac, Louisianna, from its mouth to the Mississippi River.

JULY 10, 1882.—Referred to the Committee on Commerce and ordered to be printed.

WAR DEPARTMENT,
Washington City, July 8, 1882.

The Secretary of War has the honor to transmit to the United States Senate, for the information of the Committee on Commerce, a communication from the Chief of Engineers of to-day's date, and the accompanying copy of a report from Maj. Amos Stickney, Corps of Engineers, upon a survey of Pass Manchac and Bayou Manchac, Louisiana, from its mouth to the Mississippi River, made in compliance with the requirements of the river and harbor act of June 14, 1880.

ROBERT T. LINCOLN,
Secretary of War.

The PRESIDENT *pro tempore*
of the United States Senate.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., July 8, 1882.

SIR: I have the honor to submit herewith a copy of a report to this office from Maj. Amos Stickney, Corps of Engineers, of the results of a survey of Pass Manchac and Bayou Manchac, Louisiana, from its mouth to the Mississippi River, made under the direction of the late Maj. C. W. Howell, Corps of Engineers, to comply with the requirements of the river and harbor act of June 14, 1880.

Very respectfully, your obedient servant,

JOHN G. PARKE,
Acting Chief of Engineers.

Hon. ROBERT T. LINCOLN,
Secretary of War.

SURVEY OF PASS MANCHAC AND BAYOU MANCHAC, LOUISIANA, FROM ITS MOUTH TO THE MISSISSIPPI RIVER.

UNITED STATES ENGINEER OFFICE,
New Orleans, La., June 27, 1882.

GENERAL: I have the honor to submit the following report of Assistant Engineer J. C. Buchanan on the survey of Pass Manchac and Bayou Manchac, Louisiana, from its mouth to the Mississippi River.

From the report of Mr. Buchanan it will be seen that the lower part of the Manchac from its junction with the Amite to Lake Maurepas, which is generally called Amite River, can be cleaned out for about $2,718.75; and from the junction of the Amite to a place called Bobbins for about $731.25, the total being $3,450. Above Bobbins low-water navigation could not be obtained except at a great cost, altogether incommensurate with the benefits to be obtained unless the Manchac were connected with the Mississippi by locks, which would be a work of very considerable magnitude, and which does not seem to be contemplated in the act of Congress directing the survey.

The survey, however, was made in sufficient detail to permit the making of approximate estimates if they should be needed. The bar at the mouth of the bayou, and Pass Manchac with its bars, appear to have sufficient water for navigation.

This report is accompanied by a tracing of the chart of Bayou Manchac in two sheets: a profile of the bayou, and a tracing of the chart of South Pass Manchac.

Very respectfully, your obedient servant,

AMOS STICKNEY,
Major of Engineers.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

REPORT OF MR. JOHN C. BUCHANAN, ASSISTANT ENGINEER.

NEW ORLEANS, LA., *January* 18, 1882.

SIR: I have the honor to submit herewith my report of survey of Bayou Manchac from its head to Lake Maurepas; survey of the bar at the mouth, in Lake Maurepas; survey of bar in Lake Maurepas, head of Pass Manchac; survey of Pass Manchac and bar in Lake Pontchartrain.

BAYOU MANCHAC.

Under instructions from Maj. C. W. Howell, Corps of Engineers, U. S. A., I left New Orleans on the 11th of February, 1881, and proceeded to the head of Bayou Manchac, in East Baton Rouge Parish, Louisiana. The survey was begun on the 17th of February, * * * starting the levels from bench-mark No. 26 of the Mississippi River Commission Survey.

* * * * * *

At the head of Bayou Manchac, 556 feet down the bayou, there is an earth dam thrown across the bayou, the dimensions of which are 19 by 110 feet on top, 69 feet at the base, and 8.4 feet deep. I understood that the legislature of Louisiana granted permission to the citizens to place this dam there in 1828. The course of the bayou from the Mississippi River is in an easterly direction, and for 7.5 miles to J. T. Bobbins' place has a width of from 60 to 110 feet, and in many places has little or no water in it, and is much grown up with small timber, and many trees have fallen into it. The banks are from 9 to 13 feet from top to the bottom of bayou. The fall from the head of the bayou to Bobbins is 23.527 feet. This portion of the bayou goes dry in the dry season. I estimate that the bayou can be cleaned out from its head to this point (7.5 miles) for $450 per mile = $3,375, but it would be useless for navigation during low-water in the Mississippi River unless it were excavated to a greater depth. This

would necessitate the building of locks at its head, as high-water in the Amite River overflows the Manchac nearly to Bobbins. This with the Mississippi River water flowing through the Manchac would inundate a large area of country. On the 19th of February the water in the Mississippi River was 1.23 feet lower than the head of the bayou. The country adjacent to the bayou, for a portion of the distance to Bobbins, is very fertile. I estimate that Bayou Manchac can be cleaned out from the Amite River to Bobbins, 11.25 miles, at $65 per mile = $731.25. This would not give navigation throughout the year, as in dry seasons it goes nearly dry above Alligator Bayou, 8.4 miles from its head, and for a portion of the year boats might not be able to go as far as Alligator Bayou. The fall to Alligator Bayou is 25.88 feet. The present head of navigation is to Wood's Creek, 11.1 miles from the head of bayou. A steam launch would go a little further up, to Foreman's Landing, 9.5 miles from the head of bayou, and tow down flat-boats loaded with sugar, &c.

At Hope Villa, 11.9 miles from the head of bayou, the fall is 32.09 feet, and at the bar at the junction of the Amite River, 18$\frac{3}{4}$ miles from the head of bayou, the fall is 29.18 feet. At the time of the survey there was 9.5 feet of water on the bar at the junction of the Amite, but I was told that at times there was as little as 4 feet; the bar is of sand.

The steamer Alice makes quite regular trips to Hope Villa, her draught being about 6 feet. The height of the banks above the bottom of the bayou, from the junction to Alligator Bayou, is from 13 to 25 feet.

There are very few snags or overhanging trees from the junction to Hope Villa.

An azimuth line was run from the head of the bayou to the junction of the Amite River. * * * The levels were run from the head of bayou to the junction of the Amite, and cross-sections taken about every half mile. Bench-marks were established in the vicinity of each cross-section. A chart and profile accompany this report. The levels are referred to bench-mark No. 26, Mississippi River Commission Survey.

During the time of the survey the water was quite high, and should it be the intention of the government to clean out the bayou it would be well for the bidders of the work to inform themselves regarding snags and trees fallen in the bayou at a lower stage of water than when the survey was made. * * * An examination was made of the bayou from the junction of the Amite River to Lake Maurepas.

* * * * * * *

The distance from the head of the bayou to its mouth in Lake Maurepas is 57.25 miles. There are only 36$\frac{1}{4}$ miles from Lake Maurepas to the junction of the Amite which require cleaning out. I estimate that this can be done for $75 per mile = $2,718.75.

The timber and saw-mill business are the principal industries on this portion of the bayou. This part of the bayou has a width of about 190 feet, and from 11 to 50 feet depth.

The survey of the bar at the mouth of the bayou, in Lake Maurepas, shows it to be of mud, with some sand and fine particles of clam-shells, and has a depth of 6$\frac{1}{2}$ feet of water at average low-water. A chart of the bar and bayou to the junction of the Amite River accompany this report.

PASS MANCHAC.

A base line was measured along the west rail of the railroad bridge across Pass Manchac. * * * Stations were established, and a survey of the bar at the head of Pass Manchac made. * * * This bar is of mud, sand, and particles of shells, and has 7$\frac{1}{2}$ feet of water on it at average low-water. * * * The distance from the railroad bridge to the mouth of the pass is 6.7 miles. * * * There is a depth of water in the pass from 17 to 49 feet, and a general width of 800 feet.

Survey of bar at mouth of pass, in Lake Pontchartrain, shows it to consist of mud, sand, and particles of shell, and there are two channels, having 7$\frac{1}{2}$ and 8 feet of water in them at average low-water. The deepest of these channels is the more difficult to navigate, owing to its close proximity to cypress snags, &c. A chart of Pass Manchac and bars at head and mouth of pass accompany this report.

* * * * * * *

Respectfully,

JOHN C. BUCHANAN,
Assistant Engineer.

Major AMOS STICKNEY,
Corps of Engineers, U. S. A.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 192.

LETTER

FROM THE

SECRETARY OF THE INTERIOR,

TRANSMITTING,

In response to Senate resolution of the 22d instant, a statement of the sums of money paid to the Ponca Indians since 1871, *and under what treaty obligation.*

JULY 29, 1882.—Referred to the Committee on Indian Affairs and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, July 28, 1882.

SIR: I have the honor to acknowledge the receipt of Senate resolution of the 22d instant, directing this department "to communicate to the Senate what sums of money have been paid each year since the fiscal year eighteen hundred and seventy-one, on account of the Ponca tribe of Indians, and under what law or treaty obligations the same have been paid," and in reply thereto I transmit herewith an itemized statement of amounts paid said Indians each year since fiscal year of 1871, &c., together with copy of letter from the Commissioner of Indian Affairs of the 27th instant, to whom the subject was referred for report.

I am, sir, very respectfully, your obedient servant,

H. M. TELLER,
Secretary.

THE PRESIDENT OF THE SENATE *pro tempore.*

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, July 27, 1882.

SIR: In response to Senate resolution dated the 22d instant, referred for report on the 25th, I have the honor to inclose herewith a statement of amounts paid each year, since the fiscal year 1871, on account of the Ponca tribe of Indians, and of treaties and laws under which the several sums were paid.

The resolution of the Senate is returned herewith.

Very respectfully,

H. PRICE,
Commissioner.

The HON. SECRETARY OF THE INTERIOR.

Statement of amounts paid each year since the fiscal year 1871, *on account of the Ponca tribe of Indians, and treaties and laws, as required by Senate resolution dated July* 22, 1882.

Fiscal year.	Amount expended.	Treaty and laws under which the same were paid.
1872	$27,500 00	Treaty of March 2, 1858.
1873	27,500 00	Do.
1874	27,500 00	Do.
1875	18,000 00	Do.
1876	18,000 00	Do.
1877	16,708 89	Do.
1878	22,144 68	Treaty of March 2, 1858, and act March 3, 1877.
1879	79,500 00	Treaty of March 2, 1858, and act May 27, 1878.
1880	45,301 92	Treaty of March 2, 1858, and act February 17, 1879.
1881	51,530 19	Treaty of March 2, 1858, and act May 11, 1880.
1882	53,000 00	Treaty of March 2, 1858, and act March 3, 1881.
1882	82,735 71	Treaty of March 2, 1858, and act March 3, 1881.
Total	469,421 39	

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 193.

LETTER

FROM THE

SECRETARY OF THE INTERIOR,

TRANSMITTING,

In response to Senate resolution of July 22, 1882, information relating to the issuing of pension certificates for a double pension to Ward B. Burnett, &c.

AUGUST 2, 1882.—Referred to the Committee on Pensions and ordered to be printed.

DEPARTMENT OF THE INTERIOR,
Washington, July 31, 1882.

SIR: In reply to the resolution of the Senate, passed on the 22d instant, directing the Secretary of the Interior "to inform the Senate whether he has ordered the issue of pension certificates for a double pension, one under the general law and one under the special act, to Ward B. Burnett, and when such order was made; also, to give his reasons for issuing certificates for such double pensions pending the action of Congress on the subject," the Secretary of the Interior has the honor to submit the following statement relative to the action of the Department of the Interior in this case, and the grounds for such action: The late President, General Garfield, submitted to the Attorney-General, Hon. Wayne MacVeagh, the question whether General Ward B. Burnett should be allowed an increase of pension under the act of June 16, 1880. The Attorney-General referred the matter to the Solicitor-General, who reached a conclusion favorable to General Burnett.

On the 23d of June, 1882, the Secretary of the Interior addressed to the Attorney-General a letter propounding certain questions touching the case, involving disputed questions of law. This letter was referred to the Solicitor-General, who answered each question in the negative, without argument, and giving no reasons for his answers. Acting on the answer, the Department of the Interior rejected the application of General Burnett. In March, 1882, General Burnett again appealed to the President, who again referred the case to the Attorney-General, who, on the 10th of April last, returned to the President his opinion, which is submitted herewith. On the 12th of May, 1882, the Secretary of the Interior instructed the Commissioner of Pensions, as follows:

DEPARTMENT OF THE INTERIOR,
Washington, May 12, 1882.

SIR: My attention has been called to the claim (certificate No. 3851) of Ward B. Burnett, for increase of pension from $50 to $72 per month.

This claim is made under the provisions of an act of Congress approved June 16, 1880, entitled "An act to increase the pension of certain pensioned soldiers and sailors

who are utterly helpless from injuries received or disease contracted while in the United States service."

It has heretofore been considered by your office and by this department, and the facts in the case are so familiar to both as not here to need recital.

An appeal was made to the President, who referred the matter to the Attorney-General for examination and opinion; which opinion (dated the 10th ultimo), favorable to the claimant, has been transmitted by the President to this department.

The Attorney-General thinks the claim meritorious. His language is as follows:

"The intent and spirit of the act of June 16, 1880, is that all those soldiers and sailors whose *present right* it was at the time of its passage to demand and receive a pension of $50 a month under the law of 1874 should have the same increased to $72.

"To say that only those who on the 16th of June, 1880, were upon the pension roll under the act of 1874 are entitled to the increase, is to put too literal and narrow a construction upon the statute.

"The words 'now receiving' in the act of 1880 should be construed to mean *now entitled to receive*. The intent and purpose of Congress in passing the act should be considered, and a reasonable and liberal construction given to it. It could never have been the intention of Congress to shut out from its bounty veterans who, like General Burnett, totally disabled and helpless from wounds received in battle, had through ignorance neglected to put themselves upon the pension roll. * * *

"It appears that the pensioners, who, under the *general* law, were on June 16, 1880 entitled to receive $31.25 per month (which is General Burnett's case), are under the act of June 16, 1880, entitled to $72 per month. There is no doubt that this is the intention of Congress."

By authority of and in accordance with the opinion of the Attorney-General as above quoted, you will place the name of Ward B. Burnett upon the pension rolls at $72 per month, the increase to take effect under the provision of the act of June 16, 1880, and issue certificate accordingly, without further examination of the claimant.

The papers in the case are herewith returned.

Very respectfully,

H. M. TELLER,
Secretary.

The COMMISSIONER OF PENSIONS.

A question having arisen as to the time the $72 pension should commence, the Secretary gave the Commissioner further instructions, as follows:

DEPARTMENT OF THE INTERIOR.
Washington, May 31, 1882.

SIR: Referring to the appeal of Col. Ward B. Burnett, certificate No. 3851, war with Mexico, from the action of your office fixing the 3d of March, 1879, the date of the special act of Congress increasing his pension to $50 per month, as the date from which the rate of $72 per month should be allowed under the act of June 16, 1880, I have to state under the opinion of the Attorney-General given on the 10th ultimo, Colonel Burnett is entitled to all the benefits conferred by the act of June 16, 1880; that is, to a pension of $72 per month from the 17th of June, 1878.

You will please therefore issue a certificate allowing the pension at the rate of $72 per month from the 17th of June, 1878.

The papers in the case are herewith returned.

Very respectfully,

H. M. TELLER,
Secretary.

The COMMISSIONER OF PENSIONS.

This was not satisfactory to General Burnett, who claimed that it was not in accordance with the opinion of the Attorney-General. The Secretary of the Interior then addressed the following letter to the Attorney-General.

DEPARTMENT OF THE INTERIOR.
Washington, June 24, 1882.

SIR: Referring to your opinion of the 10th of April last, concerning the right of General Ward B. Burnett to increase of pension, I have the honor to state that the allowance of $72 per month from June 17, 1878, which the Commissioner of Pensions was directed by this department to make under said opinion, is objected to by General Burnett who claims a higher rate of pension for the period since June 4, 1872.

I have the honor therefore to request your views as to the rate or rates of pension

which should be allowed in the case from June 4, 1872, to the present time, and the dates from which such rates should be allowed.

The papers in the case are herewith submitted.

Very respectfully,

H. M. TELLER.
Secretary.

The Hon. the ATTORNEY-GENERAL.

To which the Attorney-General replied June 29, a copy of which opinion is herewith submitted. The Secretary of the Interior, being somewhat in doubt as to the proper course to pursue under the several opinions of the Department of Justice, on the 3d of July submitted the following to the Attorney-General:

DEPARTMENT OF THE INTERIOR,
Washington, July 3, 1882.

SIR: I have the honor to acknowledge the receipt of your letter of the 29th ultimo, in reply to the letter of this department of the 24th ultimo, requesting your views as to the rates of pension which should be allowed Col. Ward B. Burnett for the period since June 4, 1872.

In your letter you state: "I am of opinion that two pension certificates should be issued to General Burnett, one under the act of June 16, 1880, the other under the special act of March 3, 1879."

I have the honor to call your attention to section 4715 of the Revised Statutes, which directs "that nothing in this title shall be so construed as to allow more than one pension at the same time to the same person or persons entitled jointly; but any pensioner who may so elect may surrender his certificate and receive in lieu thereof a certificate for any other pension to which he would have been entitled had not the surrendered certificate been issued. But all payments previously made for any period covered by the new certificate shall be deducted from the amount allowed by such certificate."

By the special act of March 3, 1879, granting an increase of pension to General Burnett, the Secretary of the Interior was directed to "pay him a pension of $50 per month, in lieu of the pension he now receives." The phrase, "in lieu of the pension he now receives," was construed by this department to mean in lieu of the pension under the general law.

I would respectfully inquire whether section 4715, prohibiting the payment of two pensions at the same time to the same person escaped your attention, and, in case it did not, under what ground it is held that it is not applicable to the case of General Burnett, to prohibit the issue to him of two certificates of pension covering the same period of time.

Very respectfully,

H. M. TELLER,
Secretary.

The Hon. the ATTORNEY-GENERAL.

On the 7th of July the Attorney-General submitted his opinion of that date, which is submitted herewith. Thereupon the Secretary of the Interior directed the Commissioner of Pensions as follows:

DEPARTMENT OF THE INTERIOR,
Washington, July 11, 1882.

SIR: I inclose herewith an opinion of the Attorney-General in the pension case of General Ward B. Burnett.

The case was submitted to the Attorney-General by the President.

Under the circumstances, I consider it the duty of this department to be governed by the opinion of the Attorney-General in the settlement of this claim, but as there are some peculiar circumstances connected with the case the opinion will not govern the department in other cases.

You will please issue the certificates to General Burnett, in accordance with the inclosed opinion.

Very respectfully,

H. M. TELLER,
Secretary.

The COMMISSIONER OF PENSIONS.

On the 3d of June the Commissioner issued a certificate for $72 per month, and after the late opinion of the Attorney-General a certificate

for $50 was dated July 17, 1882, and a new certificate in place of the one issued June 3 was also issued for $72 per month. Both the last-named certificates were signed by the Secretary of the Interior. These certificates were sent to the Commissioner of Pensions. General Burnett, through his wife, complaining of unnecessary delay, the Secretary of the Interior sent the following to the Commissioner of Pensions:

DEPARTMENT OF THE INTERIOR,
Washington, July 19, 1882.

SIR: What I want with reference to General Burnett's certificates is that they go forward without unnecessary delay, through the proper official channels. Mrs. Burnett claims that there is unnecessary delay. I do not care about their delivery to General Burnett, and if they go in due course of mail to-day it is all that is necessary. Explain this matter to Mrs. Burnett if she calls upon you.

Very respectfully,

H. M. TELLER,
Secretary.

Hon. W. W. DUDLEY,
Commissioner of Pensions.

The Secretary of the Interior is asked to furnish the Senate with his reasons for the issuing of such certificates for such double pension pending the action of Congress on the subject. The question as to what amount of pension General Burnett was entitled to receive had been submitted by the President of the United States to the proper law officer of the government, and such officer had determined that he was entitled to the pensions of $50 per month and $72 per month, making a total of $122 per month. That there might be no mistake the Secretary of the Interior called for a review of that opinion. He found on file three carefully-prepared opinions of the Attorney-General in favor of paying the pension to General Burnett.

It cannot be supposed that the President of the United States submitted the question in dispute between officers of the Interior Department and General Burnett to the Attorney-General for his opinion, with the intention of ignoring such opinion if it was adverse to the ruling of the department. And when doubts arose in the mind of the present Secretary of the Interior as to the proper administration of the law under the opinion of the Attorney-General, and he submitted the question to the Attorney-General, he did not intend to disregard his opinion if it should not be in accordance with his own. The Secretary of the Interior is of the opinion that the ordinary rules of propriety would have been grossly violated if he had refused to receive as the law of the case the law as enunciated by the Attorney-General. The question had passed beyond the control of the Interior Department by the action of the President in the first place, and secondly by the action of the department.

Pending the proceedings in the Department of the Interior with reference to the pension, a resolution was introduced into the Senate touching this matter. The Secretary of the Interior understood as a question of law that there could be no ground of controversy as to the right of General Burnett to all the pension money that had accrued, and that any proceedings of Congress in relation to the pension heretofore granted him could not affect his right to receive the money that had accrued to him. These certificates had been withheld from General Burnett under what the law officer of the government had declared was an improper ruling of the department, and by the withholding of the certificates he had been deprived of the money due him. It was alleged that by such refusal to pay he had been greatly embarrassed and put to great trouble

and expense. To enable him to receive that money it was necessary that he should have his certificates, which the Attorney-General has declared it was his right to receive.

The Secretary of the Interior was also of the opinion that the due administration of the law of his department did not require him to await the action of Congress to see whether the law might or might not be repealed; he understood it was his duty to execute existing laws, and not such as might be passed. If the words in the joint resolution, "pending the action of Congress on that subject," are intended as a declaration of the Senate that it is the duty of an officer charged with the speedy execution of the law to await the action of Congress when such law shall be assailed in either branch of Congress, it must be regarded as the enunciation of a new principle, and one of which the Secretary of the Interior confesses entire ignorance.

To hold that an officer charged with the execution of a law must suspend action whenever that law is assailed in Congress, would enable a single member to nullify the law during the session of Congress. The department is charged with the distribution of large sums of money as pensions to those who have been declared by the competent authority created by law entitled to the same. It cannot be supposed that when the statutes providing for such pensions are assailed the Secretary of the Interior will cease to pay such pensions and await the action of Congress. The administration of law must proceed until such laws are repealed by competent authority. This was the course pursued by the Secretary of the Interior with reference to the pension of General Ward B. Burnett, who has received only that adjudged to be his due. If it was not desirable to allow General Burnett to continue to draw one pension at $50 and another at $72 per month, the case was in no wise embarrassed by the issue of the certificates; but such pension must be paid until Congress should otherwise order, or General Burnett should voluntarily surrender his claim to such payment. On the 22d instant, General Burnett surrendered the certificate for $50, and declared, in writing, his intention to claim only the pension of $72 per month, unless Congress should by further legislation give him an increased pension.

The Secretary of the Interior does not by his answer intend to admit the right of the Senate by resolution to call on him for the reasons that induced him to issue such certificates, believing that he cannot be called to an account even for an error of judgment in that way; but not desiring to raise a question of so much importance, and involving such important principles of administration on such a case, has fully, and to the best of his ability, responded to such resolution.

Very respectfully,

H. M. TELLER,
Secretary.

The PRESIDENT OF THE SENATE *pro tempore.*

DEPARTMENT OF JUSTICE,
Washington, D. C., July 7, 1882.

SIR: In the pension case of General Ward B. Burnett, I have the honor to observe in reply to your letter of the 3d instant, that the said pensioner under the general act of 1874 was entitled to, *though he was not receiving*, a pension of $50 a month. While so entitled Congress passed a special act giving him another pension. This did not take away his right under the general law, nor was his pension merged in that granted by the special act.

The case is exceptional. In the law under the title "pensions," as enacted in 1873, nothing can be so construed as to allow more than one pension at the same time to

the same person. But subsequently Congress having the power, stepping beyond the rule prescribed in section 4715, by a separate independent law gives to a pensioner already entitled to a pension of $50 another pension of the same amount. Section 4715 has, in my judgment, no application to a case of this kind.

The special act of March 3, 1879, has not been repealed or its force and effect taken away by any subsequent legislation.

I adhere to the opinion expressed in my letter of the 29th ultimo.

Very respectfully, your obedient servant,

BENJAMIN HARRIS BREWSTER,
Attorney-General.

Hon. H. M. TELLER,
Secretary of the Interior.

DEPARTMENT OF JUSTICE,
Washington, D. C., June 29, 1882.

SIR: Replying to your letter of the 24th instant, concerning the case of General Ward B. Burnett, I have the honor to advise you that according to the opinion rendered by this department on the 10th of April last, the rates of pension which should be allowed General Burnett are as follows:

From June 4, 1872, to June 4, 1874, $31.75 per month. (Act of March, 1873, fourth section.)

From June 4, 1874, to June 17, 1878 (act of June 18, 1874), $50 per month.

From June 17, 1878, $72 per month. (Act of June 16, 1880.)

Under the special act of March 3, 1879, General Burnett has drawn and is entitled still to draw $50 per month. True, this was given him '*in lieu of the pension he now receives*,' but the pension he was then receiving was $30 per month. This was not the sum which he was entitled to receive under the general law.

The $30, it is presumed, was paid him under section 4695 Revised Statutes, as for total disability, and in lieu of this the special act gives him $50. It is provided also that nothing *in this act* (the special act) shall entitle General Burnett to arrears of pension.

It is not under this act that back pay of pension is claimed, but under the general laws cited above which entitle him to the rates of pension prescribed therein.

I do not think the special act can be so construed as to deprive General Burnett of these. It should be construed as a law by itself intended to show the estimate by Congress of the great services of General Burnett to the country, having regard also to his helpless condition.

I am of opinion that two pension certificates should be issued to General Burnett—one under the act of June 16, 1880, the other under the special act of March 3, 1879.

Very respectfully, your obedient servant,

BENJAMIN HARRIS BREWSTER,
Attorney-General.

Hon. H. M. TELLER,
Secretary of the Interior.

DEPARTMENT OF JUSTICE,
Washington, D. C., April 10, 1882.

SIR: The late President (Garfield submitted to Hon. Wayne MacVeagh the question whether General Ward B. Burnett should be allowed the increase of pension granted by the act of June 16, 1880, to a certain class of pensioners. The Attorney-General referred the matter to the Solicitor-General.

In a memorandum made and submitted to the Attorney-General on the 15th of June, 1881, the Solicitor reaches a conclusion favorable to General Burnett's claim and says that it is very meritorious, adding that it is "met by objections that are only *inter apices juris.*"

On the 23d of June, 1881, the Secretary of the Interior addressed a letter to the Attorney-General propounding several questions touching the case involving nice points of law. This letter also was referred to the Solicitor-General, who answered each of the questions put by the Secretary in the negative without assigning reasons.

This answer went to the Interior Department as the opinion of the Department of Justice upon the whole case. Its effect was to reject General Burnett's application.

General Burnett has again appealed to the President, who again, March 25, 1882, refers the case to the Attorney-General, and noting the "seeming conflict of opinion in the two communications upon the subject from the Department of Justice," desires a *further examination.*

It is upon this second appeal to the President that the case is now before me.

After looking carefully into the case I am inclined to concur in the *first* opinion intimated by the Solicitor-General in his report made to the Attorney-General on the 15th of June, 1881.

It is admitted that General Burnett was entitled to a pension of $50 per month under the law of June 18, 1874, though it is under a *special act* that he has received that sum as a pension.

The intent and spirit of the act of June 16, 1880, is that all those soldiers and sailors whose *present right* it was at the time of its passage to demand and receive a pension of $50 a month under the law of 1874 should have the same increased to $72 To say that only those who, on the 16th of June, 1880, were upon the pension roll under the act of 1874 are entitled to the increase, is to put too literal and narrow a construction upon the statute. The words "*now receiving*" in the act of 1880 should be construed to mean *now entitled to receive*. For if the precise literal meaning is insisted on, only those who *on that day*—the 16th of June, 1880—actually received their pensions under the law of 1874 could have the increase; but this is absurd.

The intent and purpose of Congress in passing the act should be considered, and a reasonable and liberal construction given to it. It could never have been the intention of Congress to shut out from its bounty veterans, who, like General Burnett, totally disabled and helpless from wounds received in battle, had through ignorance neglected to put themselves upon the pension roll.

It is, however, objected that if General Burnett's name was placed on the roll under the general law, an increase of pension could not be allowed him except from the date of an examining surgeon's certificate made under a pending claim for such increase. The objection is founded upon section 4698, 1–2 Revised Statutes. The answer is that General Burnett is within the exception of that law. His disability is and has been for more than ten years *specific* and *permanent*.

Again, it is objected that if General Burnett's name should be placed on the roll under the law of 1874 *to receive a pension under that law* from a date subsequent to June 16, 1880, his pension could not be increased under the act of the latter date. This is clearly *inter apices juris*.

If his name were placed *now* upon the pension roll he would not receive his pension under the act of 1874, but under the act of June 16, 1880. The act of 1874 was an amendment of the fourth section of the general pension law of March 3, 1873 (sec. 4698 Revised Statutes), in this particular *only*, that it raised the pensions of those who were entitled to $31.25 per month under the law of 1873 to $50. Then the act of June 16, 1880, comes in and simply increases the pensions of the same class of pensioners to $72 per month. It is a substitute for the act of 1874 and abrogates it.

It appears that the pensioners who under the *general law* were on June 17, 1880, entitled to receive $31.25 per month (which is General Burnett's case), are, under the act of June 16, 1880, entitled to $72 per month. There is no doubt that this was the intention of Congress.

Cases like General Burnett's are entitled to the increase, no matter when they make application for it. The facts showing his right to be upon the pension roll, not the time when his name is placed there, are the important and governing considerations.

Very respectfully, your obedient servant,

BENJAMIN HARRIS BREWSTER,
Attorney-General.

The PRESIDENT.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC No. 194.

THE CLAYTON-BULWER TREATY

AND

THE MONROE DOCTRINE.

A LETTER

FROM

THE SECRETARY OF STATE

TO

THE MINISTER OF THE UNITED STATES AT LONDON

DATED MAY 8, 1882,

WITH SUNDRY PAPERS AND DOCUMENTS EXPLANATORY OF THE SAME, SELECTED FROM THE ARCHIVES OF THE DEPARTMENT OF STATE.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1882.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING,

In response to the Senate resolution of the 15th of July, 1882, a report of the Secretary of State and accompanying papers relating to the Clayton-Bulwer treaty.

AUGUST 3, 1882.—Read and referred to the Committee on Foreign Relations.

AUGUST 4, 1882.—Ordered printed.

To the Senate of the United States:

I transmit herewith, in response to the Senate resolution of the 15th instant, a report of the Secretary of State and accompanying papers relating to the Clayton-Bulwer treaty.

CHESTER A. ARTHUR.

EXECUTIVE MANSION,
Washington, July 29, 1882.

To the President:

The Secretary of State, to whom was referred the resolution of the Senate of the 15th instant, requesting the President, "if not incompatible with the public interest, to furnish the Senate with copies of the declaration of Sir Henry Lytton Bulwer and Mr. Clayton on the exchange of the ratifications of the Clayton-Bulwer treaty on the 4th day of July, 1850, and any other documents referred to in the instruction of Mr. Frelinghuysen to Mr. Lowell dated the 8th day of May, 1882," has the honor to lay before the President, for transmission to the Senate in response to the resolution, the accompanying copy of the declaration of Sir Henry Bulwer and Mr. Clayton described therein, together with a selection of such other documents cited in the instruction of May 8 to Mr. Lowell as seem to come within the purview of the resolution.

Respectfully submitted.

FRED'K T. FRELINGHUYSEN.

DEPARTMENT OF STATE,
Washington, July 29, 1882.

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I.

NOTE.

Mr. Frelinghuysen to Mr. Lowell.

No. 368.] DEPARTMENT OF STATE,
Washington, D. C., May 8, 1882.

SIR: Mr. Sackville West has handed me copies of two dispatches from Lord Granville to him respecting the Clayton-Bulwer treaty; the first, dated 7th January last, comments upon Mr. Blaine's 270 of the 19th of November; the second, of the 14th January, comments upon Mr. Blaine's 281 of the 29th November.

They have been read with interest and with attention. After careful consideration, the President is not without hope that the views of the two governments may be harmonized in this matter. He therefore directs me to communicate to you, somewhat at length, the opinions entertained here respecting the traditional continental policy of the United States and the Clayton-Bulwer treaty.

A canal across the isthmus for vessels of all dimensions and every character, under possible conditions hereinafter referred to, would affect this republic in its trade and commerce; would expose our Western coast to attack; destroy our isolation; oblige us to improve our defenses and to increase our Navy, and possibly compel us, contrary to our traditions, to take an active interest in the affairs of European nations. The United States, with their large and increasing population and wealth, cannot be uninterested in a change in the physical conformation of this hemisphere which may injuriously affect either the material or political interests of the republic, and naturally seek that the severance of the isthmus connecting the continents shall be effected in harmony with those interests. This government, while believing that the isthmus should not be severed so as to do unnecessary injury to the United States, at the same time appreciates the desire of Great Britain that she should be able, by a short and easy passage from ocean to ocean, to reach her eastern and American possessions on the Pacific, and that other nations of the world have a similar interest in such a passage.

There is, however, no necessary conflict between the political claims of the United States in this matter and the material interests of other nations.

A canal across the isthmus can be created, and under the protectorate of the United States and the republic whose territory it may cross, can be freely used by all nations; thus in some degree would be continued to the United States the benefit of that conformation of the earth which is now an element of security and defense.

For thirty years the Panama Railroad has been maintained without other protection than that of the United States and the local sovereign, in accordance with the treaty of 1846 with New Grenada.

During that period Great Britain has carried to a successful result the wars of the Crimea and the Indian mutiny; France has three times convulsed Europe with strife; a conflict between Russia and Turkey has changed the face of the Ottoman Empire; thrones have crumbled; empires have been constructed; republics have arisen, while on this continent the most remarkable civil war in history has occurred, and at the same time the Emperor of the French was lending his active support to an aspirant for imperial honors in the neighboring republic of Mexico. Within that period almost every form of war and strife have taken place that would seem to make especially necessary the neutralization of the isthmus, and yet the trains of the Panama Railroad have run from ocean to ocean peacefully and with no other interruption than what has come from the rare turbulence of the local population.

During the same time another isthmus has been pierced, and while wars have raged within sight of the Mediterranean port the peaceful commerce of the world has moved through the Suez Canal quietly and safely under no international protectorate.

If no guarantee or protectorate has been found necessary during such troubled times, it can scarcely be required in the more peaceful period which both the Government of the United States and that of Great Britain hope and strive for.

The President, therefore, considers it unnecessary and unwise, through an invitation to the nations of the earth, to guarantee the neutrality of the transit of the isthmus, or to give their navies a pretext for assembling in waters contiguous to our shores, and to possibly involve this republic in conflicts from which its natural position entitles it to be relieved.

It will doubtless occur to Lord Granville, as it does to us, that in-

ternational agreements of this kind calling for interference by force, and conferring joint rights upon several independent powers, are calculated to breed dissension and trouble. In times of peace, when there is no call for their exercise, they are harmless though useless. But when wars and trouble come, it too frequently happens that differences arise, and so at the very moment when the agreement should be enforced it is impossible to enforce it; and such agreements would lead to that political intervention in American affairs which the traditional policy of the United States make it impossible that the President should either consent to or look upon with indifference.

The President believes that the formation of a protectorate by European nations over the isthmus transit would be in conflict with a doctrine which has been for many years asserted by the United States. This sentiment is properly termed a doctrine, as it has no prescribed sanction and its assertion is left to the exigency which may invoke it. It has been repeatedly announced by the Executive Department of this Government and through the utterances of distinguished citizens; it is cherished by the American people, and has been approved by the Government of Great Britain.

It is not the inhospitable principle which it issometimes charged with being and which asserts that European nations shall not retain dominion on this hemisphere and that none but republican governments shall here be tolerated; for we well know that a large part of the North American continent is under the dominion of Her Majesty's Government, and that the United States were in the past the first to recognize the imperial authority of Dom Pedro in Brazil and of Iturbide in Mexico. It is not necessary now to define that doctrine, but its history clearly shows that it at least opposes any intervention by European nations in the political affairs of American republics.

In 1823, Mr. Canning, with the concurrence of the cabinet of London, informed Mr. Rush that Great Britain could not see with indifference the intervention of foreign power in Spanish America, or the transfer to those powers of any of the colonies, and suggested a joint declaration to that effect by the United States and Great Britain. This suggestion grew out of the relations then existing between France and Spain, their attitude towards the South American republics then struggling for independence, and the injuries to the colonies and commerce of Great Britain which would result from a successful prosecution of the policy of those two governments. President Monroe did not adopt

the proposal for a joint declaration, but in his message of December 2, 1823, after stating that it was our policy not to interfere with the internal concerns of European powers, speaking of the war which the revolted colonies were carrying on against Spain, and of contemplated interference by the "Holy Alliance" in behalf of the latter, said, in language which has gone into history under his name, thus:

> But in regard to these continents circumstances are eminently and conspicuously different. It is impossible that the allied powers should extend their political system to any portion of either continent without endangering our peace and happiness, nor can any one believe that our southern brethren, if left to themselves, would adopt it of their own accord. It is equally impossible, therefore, that we should behold such interposition in any form with indifference.

This sentiment was received in England with enthusiasm. Mr. Brougham said:

> The ques ion in regard to Spanish America is now, I believe, disposed of or nearly so; for an event has recently happened than which none has ever dispensed greater joy, exultation, and gratitude over all the freedmen of Europe; that event which is decisive on the subject is the language held with respect to Spanish America in the message of the President of the United States.

Sir James Mackintosh said:

> This evidence of the two great English commonwealths (for so I delight to call them, and I heartily pray that they may be forever united in the cause of justice and liberty) cannot be contemplated without the greatest pleasure by every enlightened citizen of the earth.

Mr. John Quincy Adams, who well knew what had led to these statements by Mr. Monroe, explained in a message to the House of Representatives on the 17th day of March, 1826, that there was no purpose of interfering with the existing European colonies in America; that the language was only a frank declaration that the United States could not look with indifference either upon an attempt by colonization to close any port of the continent against the commerce of the United States or upon concerted political interference from Europe in American affairs.

Thus the doctrine of non-intervention by European powers in American affairs arose from complications in South America, and was announced by Mr. Monroe on the suggestion of the official representative of Great Britain.

The doctrine so formulated by Monroe and expounded by Adams has since remained a cardinal principle of our continental policy. In several notable instances, especially in the case of the French attempt to set up imperial authority in Mexico, it guided our political action, and it is to-day firmly imbedded in the American heart.

It is true that this doctrine refers to the political and not to the material interest of America; but no one can deny that to place the isthmus under the protection and guarantee of the powers of Europe, rather than under the protection of the leading power of this hemisphere, would seriously threaten and affect the political interest of that power.

It is not to be anticipated that Great Britain will controvert an international doctrine, which she suggested to the United States, when looking to her own interest, and which, when adopted by this Republic, she highly approved; and it is but frank to say that the people of this country would be as unwilling that the pathway of commerce between the Pacific coast and our eastern market should be under the dominion of the allied European powers as would be the people of Great Britain that the transit from one to another part of her possessions should be under such control.

Prior to the war of the Revolution, Great Britain had acquired strong positions from Halifax to Antigua, dominating the coast of the United States. She retained these positions after the peace of 1783, and continues to use them for offensive and defensive purposes. She has strengthened old strongholds and made new ones, while the United States has ever refused to avail herself of proffered commanding external military stations.

No well-informed statesman doubts the ability of this nation to raise a powerful navy. To raise such a navy might bring commercial advantages to the United States, but it is doubtful whether it would promote the peace of the world; and the United States desire that their citizens may, without any armed assertion of right, be conveyed by water transit from their western to their eastern shores without passing under the guns of European powers.

These are our own views, and it is but frank to state them, while Her Majesty's Government is not called upon either to admit or deny them.

To considerations such as these Lord Granville, in his dispatch of November 10, 1881, answers that the position of Great Britain and the United States, in reference to the canal, is determined by the—

Engagements entered into by them respectively in the convention, which was signed at Washington on the 19th of April, 1850, commonly known as the Clayton-Bulwer treaty, and that Her Majesty's Government rely with confidence upon the observance of all the engagements of that treaty.

We are thus fairly brought to the consideration of the Clayton-Bulwer treaty.

The treaty relates to communication between the oceans, and divides itself into two parts:

First, and principally, that which the treaty terms a "particular object," to wit, a then projected interoceanic canal in Central America by the Nicaragua route; and this is the only object stated in the preamble of the treaty, which says that the two governments, "being desirous of consolidating the relations of amity which so happily subsist between them, by setting forth and fixing in a convention their views and intentions with reference to any means of communication by ship-canal which may be constructed between the Atlantic and Pacific Oceans by the way of the river San Juan de Nicaragua and either or both of the lakes of Nicaragua or Managua to any port or place on the Pacific Ocean," to that end confer full powers on Mr. Clayton and Sir Henry Bulwer.

This first and principal object of the treaty is considered in the first seven articles.

Second. The subordinate object of the treaty is that treated of in the remaining or eighth article, which states that the two governments "having not only desired, in entering into this convention, to accomplish a *particular object*, but also to establish a general principle (and this is the principle), hereby agree to extend their protection by treaty stipulation to any other practicable communication" across the isthmus, "and especially to the interoceanic communications, should the same prove practicable, whether by canal or railroad, which are now proposd to be established by the way of Tehuantepec or Panama." This "general principle" or joint protection is to be effected as stated, "by treaty stipulations."

Although this discussion relates to a canal by the Panama route outside of Central America, to which the eighth article refers, yet your attention is invited as well to the first and principal as to the second and subordinate purpose of the treaty.

First. While the primary object of the treaty, as will be seen, was to aid the immediate construction of a canal by what is known as the Nicaragua route, it is equally plain that another and important object, which the United States had in view, was to dispossess Great Britain of settlements in Central America, whether under cover of Indian sovereignty or otherwise. The United States were tenacious that Great

Britain should not extend further her occupation of threatening military or naval strategic points along their maritime frontier. To assure this, the parties to the treaty jointly agreed not to exercise dominion over, or fortify or colonize Nicaragua, Costa Rica, the Mosquito coast, or any part of Central America. Great Britain, however, exercises dominion over Belize or British Honduras, the area of which is equal to that of Massachusetts, Connecticut, and Rhode Island, and the impression prevails that since the conclusion of the treaty of 1850, the English inhabitants of that district have spread into the territory of the neighboring republics and now occupy a large area of land which, under the convention, belongs to one or the other of the two republics, but over which the Government of Her Majesty assumes to exercise control.

Such dominion seems to be inconsistent with that provision of the treaty which prohibits the exercise of dominion by Great Britain over any part of Central America. This makes it proper for me to say that the English privileges, at the time of the conclusion of the Clayton-Bulwer treaty, in what has been known as the Belize, were confined to a right to cut wood and establish saw-mills in a territory defined by metes and bounds. These privileges were conferred by treaties, in which Spanish sovereignty was recognized. On the successful revolution, the rights of Spain vested in the new republics, and had not been materially changed when the Clayton-Bulwer treaty was concluded. That treaty was concluded April 19, and its ratification advised by the Senate May 22, 1850. On the exchange of the ratifications, Sir Henry Bulwer filed in this department, under date of June 29, 1850, a declaration that the exchange was made with the understanding on the part of Her Majesty's Government that the treaty did not apply to Her Majesty's *settlement* at Honduras and its dependencies. Mr. Clayton answered, under date of July 4, 1850, that he so understood, but that he must not be understood to either affirm or deny British title therein. It is to be observed that each of these declarations was made after the conclusion of the treaty by the joint action of the President and the Senate, and that the declaration was not made to or accepted by them. In 1859 Great Britain entered into a treaty with Guatemala, in which what had been called the *settlement* in the declaration made on the exchange of the ratification of the Clayton-Bulwer treaty was styled "Her Britannic Majesty's settlement and possessions."

In the treaty with Guatemala the boundaries were defined, and it was agreed that all on one side of the defined boundaries "belongs to Her

Britannic Majesty." It is further understood that when the commissioners met to mark the boundary in accordance with the agreement, it was found that the subjects of Great Britain had occupied so much more of Guatemala than was supposed that the commissioner on the part of Her Majesty's Government refused to proceed, and this large area of land has since remained practically in the possession of Great Britain.

The United States have never given their assent to this conversion of the British "settlement" in Central America under Spanish-American sovereignty into a British "possession" with British sovereignty. There is a vast difference between a settlement subject to the sovereignty of the Central-American republic and a colony controlled by Great Britain.

Under the treaty of 1850, while it is binding, the United States have not the right to exercise dominion over or to colonize one foot of territory in Central America. Great Britain is under the same rigid restriction. And if Great Britain has violated and continues to violate that provision, the treaty is, of course, voidable at the pleasure of the United States.

Again, it is well known that the parties to the Clayton-Bulwer treaty anticipated that a canal by the Nicaragua route was to be at once commenced. Under the assumption of a protectorate of Mosquito, British authority was at that time in actual and visible occupation of one end of the Nicaragua route, whether with or without title is not now material, and it was intended by this treaty to dispossess Great Britain of this occupation. This object was accomplished in 1859 and 1860 by treaties between Great Britain, Guatemala, Honduras, and Nicaragua, referred to in Lord Granville's dispatch of January 14, 1882. It was to this adjustment, which was one of the prime objects of the treaty, and not to the colonization of British Honduras that Mr. Buchanan in his message of December 3, 1860, alludes as "an amicable and honorable adjustment of dangerous questions arising from the Clayton-Bulwer treaty."

When the Clayton-Bulwer treaty was concluded it was contemplated that the Nicaragua Canal, to which the treaty principally had relation, would be at once commenced and finished with all possible speed by American and British capital under the impulse of the joint protectorate. This appears not only from the context of the treaty, but also from the history of the negotiations which led to the treaty, and the relations which then existed between this government and the Central American states.

On December 12, 1846, New Grenada, by a treaty of commerce, in consideration of certain guarantees, made the United States valuable grants relating to the Panama route, to which your attention will be directed when we consider the rights of this Republic in relation to the Panama route.

The discovery of gold in California soon made it important to find some rapid way of reaching it. Notwithstanding the progress of the Panama Railroad scheme, public feeling was running strongly in favor of a ship-canal large enough to accomodate ocean steamships. Influenced by this strong feeling the minister of the United States in Nicaragua, without instructions, negotiated a treaty with that republic, which conferred upon certain citizens of the United States the valuable right to construct a ship-canal from San Juan on the Atlantic coast to the Pacific. Nicaragua claimed sovereignty over the whole of the line of the proposed canal, while Great Britain, as I have shown, claimed sovereignity over a portion of it occupied by the Mosquito Indians.

At the time of the concession by Nicaragua it would have been impossible to procure in the United States the capital necessary for the construction of a ship-canal from the Atlantic to the Pacific.

Hence it was that, when Mr. Clayton learned of the concession, he at once informed Mr. Crampton, the British minister, saying that the United States did not propose to avail themselves exclusively of these privileges, but wished a canal constructed, and that the claim of Great Britain on behalf of the Mosquito Indians, which the United States could not admit, stood in the way. The Government of the United States, Mr. Clayton said, was persuaded that—

> These considerations, if fairly laid before Her Majesty's Government, would induce Her Majesty's Government to make such an arrangement with regard to the Mosquito Indians as would prevent its being an obstacle to the design in question.

President Taylor was present at the interview, and "cordially concurred." Mr. Crampton reported the conversation to Lord Palmerston the 1st October, and on the 15th of the same month transmitted to him a copy of the concession by Nicaragua to the American company. The 22d November Mr. Abbott Lawrence officially informed Lord Palmerston that an American company, aided by the subscription of a large amount of British capital, had begun to construct the Panama Railroad, and had completed the contracts for iron for it. He transmitted to Lord Palmerston a copy of the guaranty in the treaty of 1846 with New

Grenada, and invited Great Britain to join in the guaranty. In the same note he acquainted Her Majesty's Government with the concession from Nicaragua to the American canal company, and said that the conflicting claims as to Mosquito threw an obstacle in the way of the work, and invited a conversation on the subject. It seems that several conversations were had, since on the 14th of the following December Mr. Lawrence addressed a formal note to Lord Palmerston, in which, after referring to them and again setting forth the concessions for the Panama Railroad and the Nicaragua Canal, and stating that the United States had "disclaimed all intention to settle, annex, colonize, or fortify the territory of Central America, which declaration had been met by a similar disclaimer on the part of Great Britain," and also that Her Majesty's Government "had intimated their willingness to join with the United States in their guaranty of neutrality," he asked in substance, 1st. Whether Great Britain would enter into a treaty with Nicaragua similar to that negotiated by the United States? 2d. Whether Great Britain would enter into a treaty with New Grenada guaranteeing the neutrality of the railway then under construction. 3d. Whether the obstruction of the Mosquito protectorate would be removed? This note was never answered formally in London, but negotiations were transferred to Washington.

Meantime, and in the autumn of 1849, Sir Henry Bulwer had succeeded Mr. Crampton in Washington, and, soon after his arrival, commenced negotiations with Mr. Clayton for a treaty for the protection of a canal.

On the 6th of January, 1850, Sir Henry Bulwer wrote to Lord Palmerston, saying:

> Your lordship is aware that the main interest of the United States in this matter has arisen from its newly acquired possession in the Pacific, and the project of an American company to form a water communication between the two oceans, passing through the lake of Nicaragua and the River San Juan; this company having obtained from the state of Nicaragua the use of its lakes and territory for this purpose, and the use also of the river San Juan, to which Nicaragua lays claim. * * * But it so happens that while it is very difficult, not to say impossible, for Her Majesty's Government to listen to those claims of Nicaragua, our decision with respect to which has been already openly taken, there is no difficulty, I believe, whatsoever in Her Majesty's Government assisting the United States in its general views with respect to that water communication across Central America, which Great Britain must be almost as desirous as the United States to see established. * * * I am disposed to think that the best way of doing this is by a convention between Great Britain and the United States.

Negotiations conducted on this basis progressed so rapidly that on the 3d February, 1850, Sir Henry Bulwer was able to transmit for Lord Palmerston's criticism the full project of a treaty. Extracts from the

covering dispatch fully explain what the treaty was intended to accomplish:

> The State of Nicaragua made to an American company, formed for the construction of such a canal, the grant, accompanied by various favors and privileges, of all such portion of the territory claimed by it as the said company require. * * * It was, however, impossible for the contemplated scheme to be executed under any grant from the State of Nicaragua as long as the mouth of the San Juan River was in the hands of another people protected by Great Britain. * * * Both the American company, to which I have alluded, and the American Government, have latterly manifested an earnest desire to have it clearly understood that they will modify all that portion of their original engagement with Nicaragua which secures any advantages to one State which another may not equally enjoy; and if such be the spirit which is to preside over the vast project under consideration, Great Britain has not only no interest in preventing its success, but every interest in forwarding its completion and providing for its security. * * * It is with such views that the inclosed convention has been drawn up, its object being to exclude all question of the disputes between Nicaragua and the Mosquitos; but to settle in fact all that it was essential to settle with regard to these disputes as far as the ship communication between the Atlantic and Pacific and the navigation of the river San Juan were concerned.

The project, which was inclosed in this dispatch, was, in the substance of its provisions and in most of its language, identical with the treaty subsequently concluded, with one marked exception. In the project, Article VII stopped with the general provision to give encouragement and support to the first parties offering to commence the work with the necessary capital. In the subsequent negotiations the following words were added to that article, and form part of Article VII of the executed treaty:

> And if any persons or company should already have, with any State through which the proposed ship-canal may pass, a contract for the construction of such a canal as that specified in this convention, to the stipulations of which contract neither of the contracting parties in this convention have any just cause to object, and the said persons or company shall, moreover, have made preparations and expended time, money and trouble on the faith of such contract, it is hereby agreed that such persons or company shall have a priority of claim over every other person, persons, or company to the protection of the Governments of the United States and Great Britain, and be allowed a year from the date of the exchange of the ratifications of this convention for concluding their arrangements and presenting evidence of sufficient capital subscribed to accomplish the contemplated undertaking; it being understood that if at the expiration of the aforesaid period such persons or company be not able to commence and carry out the proposed enterprise, then the Governments of the United States and Great Britain shall be free to afford their protection to any other persons or company that shall be prepared to commence and proceed with the construction of the canal in question.

The Clayton-Bulwer treaty was concluded on the 19th of the following April, and I think it will not be denied that the object which President Taylor, Mr. Clayton, Sir Henry Bulwer, and Lord Palmerston had in view in making it was primarily and mainly this: To insure at the earliest possible moment the completion of the particular ship-canal for

which a concession had been made by Nicaragua to citizens of the United States on the 29th August, 1849. All the interviews of which accounts remain, and all the correspondence relate to this particular canal and to no other. As if to make assurance doubly sure, the project of a treaty which Sir Henry Bulwer sent to Lord Palmerston the 3d of February being found doubtful or insufficient in this respect, was so amended between that time and the 19th April as to make it practically certain that that grant would be accepted by both governments as the one covered by the treaty.

It was to this particular canal that were to be applied all the provisions of the first article in the treaty relating to the fortification of the canal, the control over it, and exclusive advantage in it; of the second article, relating to blockade, detention or capture; of the third and fourth articles, relating to protection during construction and to free ports; of the fifth article, in regard to a guaranty of neutrality; of the sixth article, with regard to treaties with other States, and the use of the good offices of the high contracting parties; and of the seventh article, as already noticed; but if under the provisions of the seventh article the claims of the holders of this particular concession should be set aside, then each government reserved to itself the right to determine whether its interests required it to afford protection to the holders of any other concession.

The two governments did, however, subsequently come to a harmonious agreement with regard to the grant by Nicaragua, the one contemplated by the treaty.

The company was organized, and Colonel Childs, who had been chief engineer of the canals of the State of New York, was sent to Nicaragua to make a survey. He arrived there in August, 1850, and in 1852 his report was received, printed, and laid before the Secretary of War by direction of the President, who detailed Colonel Abert and Lieutenant-Colonel Turnbull, of the United States Army, to examine it and give their opinions upon it. They approved the report on the 20th March, 1852.

On the 16th June, in the same year, Mr. Lawrence informed Lord Malmesbury of these facts, and requested Her Majesty's Government to appoint engineers of skill and experience to examine it on the part of that government.

Mr. Lawrence was on the 30th July informed that an officer of the royal engineers and an eminent civil engineer had been appointed for that

purpose, and on the 13th August their report was transmitted to Mr. Lawrence by Lord Malmesbury. The report was favorable, and a combination of British capitalists was made in contemplation of united action with American shareholders in the construction of the canal. For reasons which need not now be repeated, but principally because of the discussion which immediately began as to the clauses of the treaty relating to settlements in British Honduras, the project failed, and no canal was ever constructed under that grant.

A line of steamers was put on and run for many years, carrying passengers between New York and San Francisco. The expedition of Walker into Nicaragua terminated this line. The grant was revoked, the steamers were seized; the stockholders received no benefit from their property, and although the company nominally exists, it has been practically superseded by subsequent grants from Nicaragua to other companies.

It was also agreed in the treaty that the parties should invite other states to enter into similar stipulation, to the end that they might share in the "honor and advantage of having contributed to a work of such general interest and importance as the canal herein contemplated," to wit, that by the Nicaragua route.

It is to be observed that if other nations were to become parties to the enterprise it was only on the joint invitation of both the United States and Great Britain; but the President regards the provision as lapsed by the failure to construct the canal to which it referred, and by the fact before stated that experience has shown that no joint protectorate for any canal across the isthmus is requisite. The canal, however, now in question is on the Panama and not on the Nicaragua route.

The remaining subject of the treaty is contained in the eighth article, which relates to a canal or railway across the isthmus other than by the Nicaragua route, as by way of Tehuantepec or Panama, and it is this provision of the treaty which has occasioned this correspondence. The article provides as follows:

> The Governments of the United States and Great Britain having not only desired, in entering into this convention, to accomplish a *particular object* [to wit, the Nicaragua Canal, which, at the date of the treaty, it was thought was about to be constructed], but also to establish a general principle, they hereby agree to extend their protection, by *treaty stipulations*, to any other communications, whether by canal or railway, across the isthmus which connects North and South America, and especially to the interoceanic communications, should the same prove to be practicable, whether by canal or railway, which are now proposed to be established by the way of Tehuantepec or Panama.

It is to be here observed that the Government of the United States has a treaty with New Grenada, now a part of the United States of Colombia, entered into in 1846, by which free transit is guarantied to the citizens of the United States across the Isthmus of Panama upon any mode of communication that may be constructed, subject to no duties or burdens but such as may be imposed upon citizens of New Grenada; and by which, in order to secure the tranquil and constant enjoyment of these advantages, the United States guarantied, positively and efficaciously, the *perfect neutrality of the isthmus*, with the view that free transit from sea to sea might not be interrupted or embarrassed, and also guarantied the rights of sovereignty and property which New Grenada (now the United States of Colombia) had and possesses over said territory.

By this treaty with New Grenada the United States claim to occupy a peculiar relation to the means of transit by railroad or canal across the isthmus, within the territories of the United States of Colombia, a relation which cannot justly be superseded by the intervention of other States without the consent of the United States, duly and properly obtained. A protectorate of this kind is, like government, necessarily exclusive in its character, and implies a right and duty to make it effective. There may be a joint protectorate engaged in by mutual convention of different States, but the protectorate itself must be a unit. The treaty with New Grenada of 1846 still remains in full force. If Great Britain should desire to be united with the Government of the United States in that guaranty, of course it would require the consent of the United States of Colombia and of this government, and a convention to that end, the terms of which should be made agreeable to the parties.

Article VIII of the Clayton-Bulwer treaty relates only to those projects *now* [1850] proposed to be established; and expressly contemplates some further "treaty stipulation" on the part of Great Britain with the United States of America and New Grenada, now the United States of Colombia, before Great Britain can join the United States in the protectorate of the canal or railway by the Panama route. No such treaty stipulation has been made or has been proposed by Great Britain. Since the ratification of the Clayton-Bulwer treaty, for thirty years the United States, under the treaty of 1846 with New Grenada, has extended protection to the transit from sea to sea by the Panama Railway.

Should Her Majesty's Government, after obtaining the consent thereto

of the United States of Colombia, claim, under the Clayton-Bulwer treaty, the right to join the United States in the protection of the existing Panama Railway, or any future Panama canal, the United States would submit that experience has shown that no such joint protectorate is requisite; that the Clayton-Bulwer treaty is subject to the provisions of th · treaty of 1846 with New Grenada, while it exists, which treaty obliges the United States to afford, and secures to it the sole protectorate of any transit by the Panama route; and if Great Britain still claimed the right to join in the protectorate the United States would then determine whether the "treatv stipulations" proposed by Great Britain regulating that joint protectorate were just; and, if so, whether the length of time during which Great Britain has concurred in the protection of the Panama route under the treaty with New Grenada has or has not relieved the United States from any obligation to accept a proposal from the government to join in the guaranty.

I may then state the President's views on the whole subject, which I do with an assurance that they will meet with a candid consideration from Lord Granville, and with the hope that they may be substantially concurred in by Her Majesty's Government.

The Clayton-Bulwer treaty was concluded to secure a thing which did not exist, and which now never can exist. It was to secure the construction of a canal under the grant of 1849 from Nicaragua that the United States consented to waive the exclusive and valuable rights which had been given to them; that they consented to agree with Great Britain that they would not occupy, fortify, colonize, or assume dominion over any part of Central America; and that they consented to admit Her Majesty's Government at some future day to a share in the protection which they have exercised over the Isthmus of Panama.

The Government and people of the United States, though rich in land and industry, were poor in money and floating capital in 1850. The scheme for a canal, even without the complications of the Mosquito protectorate, was too vast for the means of the Americans of that day, who numbered then considerably less than one-half of their numbers to-day. They went to England, which had what they had not, surrendered their exclusive privileges, offered an equal share of all they had in those regions in order, as expressed in the seventh article of the treaty, "that no time should be unnecessarily lost in commencing and constructing the said canal." Through no fault of theirs time was unnecessarily lost, the work was never begun, and the concession failed.

The President does not think that the United States are called upon by any principle of equity to revive those provisions of the Clayton-Bulwer treaty which were specially applicable to the concession of August, 1849, and apply them to any other concession which has been since or may hereafter be made. The conditions of 1882 are not those of 1852. The people of the United States have now abundance of surplus capital for such enterprises, and have no need to call upon foreign capitalists. The legislative branch of the Government of the United States may also desire to be free to place the credit of the United States at the service of one or more of these enterprises. The President does not feel himself warranted in making any engagement or any admission respecting the extinct provisions of the Clayton-Bulwer treaty which would prevent or interfere with such a purpose. On the contrary, frankness requires him to say that as the persons who held the grant which the United States understood to be accepted by the two governments under the provisions of the treaty have not "carried out the proposed enterprise," the United States esteem themselves competent to refuse to afford their protection jointly with Great Britain to any other persons or company, and hold themselves free hereafter to protect any interoceanic communication in which they or their citizens may become interested in such way as treaties with the local sovereign powers may warrant and their interests may require.

There are some provisions of the treaty which the President thought might be advantageously retained. With this purpose the present correspondence was opened by the note to you of the 19th November last, in which these points were indicated. The President is still ready on the part of the United States to agree that the reciprocal engagements respecting the acquisition of territory in Central America, and respecting the establishment of a free port at each end of whatever canal may be constructed, shall continue in force, and to define by agreement the distance from either end of the canal where captures may be made by a belligerent in time of war, and with this definition thus made to keep alive the second article of the treaty. He hopes that Lord Granville on further consideration may not be averse to revising his opinion that such agreements would not be beneficial.

To the suggestion made by Lord Granville, at the close of this note of January 7, that the United States should take the initiative in an invitation to other powers to participate in an agreement based upon the convention of 1850, the President is constrained, by the considera-

tions already presented, to say that the United States cannot take part in extending such an invitation, and to state with entire frankness, that the United States would look with disfavor upon an attempt at a concert of political action by other powers in that direction.

It is not necessary to observe that there is no provision of the Clayton-Bulwer treaty which authorizes Great Britain to invite, or obliges the United States to accept, the aid of other nations to protect or to guarantee the neutrality of the Panama route.

Fortunately the want of harmony in the views of the two governments can have at present no injurious influence. No canal yet exists across the isthmus, and in the natural course of events some time must elapse before one can be constructed; meanwhile the points of divergence between Her Majesty's Government and that of the United States may disappear. The President hopes that long before the subject becomes one of practical importance Her Majesty's Government may be brought to see that the interests of Great Britain and of the United States in this matter are identical, and are best promoted by the peaceful policy which he has marked out for this country.

In the mean time the diversity of opinion which now exists will not in any wise impair the good understanding happily existing between the people and Governments of the United States and Great Britain.

You will read this dispatch to Lord Granville, and if he desires to have a copy of it you may leave one with him.

I am, sir, your obedient servant,

FREDK. T. FRELINGHUYSEN.

II.

EXPLANATORY DOCUMENTS AND PAPERS.

1.—*Definite Treaty of Peace between Great Britain and Spain. Signed at Paris, the 10th of February*, 1763.

[Extract.]

XVII. His Britannic Majesty shall cause to be demolished all the fortifications which his Subjects shall have erected in the Bay of Honduras, and other places of the Territory of Spain in that part of the World, 4 months after the Ratification of the present Treaty; and His Catholic Majesty shall not permit His Britannic Majesty's Subjects, or their Workmen, to be disturbed or molested, under any pretence whatsoever, in the said places, in their occupation of cutting, loading and carrying away logwood; and for this purpose, they may build without hindrance, and occupy without interruption, the houses and magazines which are necessary for them, for their families and for their effects; and His Catholic Majesty assures to them, by this Article, the full enjoyment of those advantages and powers on the Spanish Coasts and Territories, as above stipulated, immediately after the Ratification of the present Treaty.

2.—*Definitive Treaty of Peace between Great Britain and Spain. Signed at Versailles, 3d September*, 1783.

[Extract.]

VI. The intention of the 2 High Contracting Parties being to prevent as much as possible, all the causes of complaint and misunderstanding heretofore occasioned by the cutting of wood for dyeing, or log-wood; and several English settlements having been formed and extended, under that pretence, upon the Spanish continent; it is expressly agreed, that His Britannic Majesty's Subjects shall have the right of cutting, loading and carrying away logwood, in the District lying between the Rivers Wallis or Bellize, and Rio Hondo, taking the course of the said 2 Rivers for unalterable boundaries, so as that the navigation of them be common to both Nations, to wit: by the River Wallis or Bellize, from the sea, ascending as far as opposite to a Lake or Inlet which runs into the land and forms an Isthmus or Neck, with another similar inlet, which comes from the side of Rio-Nuevo, or New River; so that the line of separation shall pass straight across the said Isthmus, and meet another Lake formed by the water of Rio Nuevo, or New River, at its current. The said line shall continue with the course of Rio Nuevo, descending as far as opposite to a River, the source of which is marked in the Map, between Rio-Nuevo and Rio-Hondo, and which empties itself into Rio Hondo; which River shall also serve as a common boundary, so far as its junction with Rio-Hondo, and from thence descending

by Rio-Hondo to the sea, as the whole is marked on the map which the Plenipotentiaries of the 2 Crowns have thought proper to make use of, for ascertaining the points agreed upon, to the end that a good correspondence may reign between the 2 Nations, and that the English Workmen, Cutters, and Laborers may not trespass, from an uncertainty of the Boundaries. The respective Commissaries shall fix upon convenient places, in the Territory above marked out, in order that His Britannic Majesty's Subjects, employed in the felling of logwood, may, without interruption, build therein houses and magazines necessary for themselves, their Families, and their effects: and His Catholic Majesty assures to them the enjoyment of all that is expressed in the present article; provided that these Stipulations shall not be considered as derogating in any wise from his Rights of Sovereignty. Therefore all the English, who may be dispersed in any other parts, whether on the Spanish Continent, or in any of the Islands whatsoever, dependent on the aforesaid Spanish Continent, and for whatever reason it might be, without exception, shall retire within the District which has been above described, in the space of 18 months, to be computed from the exchange of the Ratifications; and for this purpose Orders shall be issued on the part of His Britannic Majesty; and on that of His Catholic Majesty, his Governors shall be ordered to grant to the English, dispersed, every convenience possible for their removing to the Settlement agreed upon by the present Article, or for their retiring wherever they shall think proper. It is likewise stipulated, that if any Fortifications should actually have been heretofore erected within the limits marked out, His Britannic Majesty shall cause them all to be demolished, and he will order his Subjects not to build any new ones. The English Inhabitants, who shall settle there for the cutting of log-wood, shall be permitted to enjoy a free Fishery for their subsistence, on the Coasts of the District above agreed on, or of the Islands situated opposite thereto, without being in any wise disturbed on that account; provided they do not establish themselves in any manner on the said Islands.

3.—*Convention between Great Britain and Spain, relative to America. Signed at London, the* 14*th of July*, 1786.

The Kings of England and of Spain animated with the same desire of consolidating, by every means in their power, the friendship so happily subsisting between them and their Kingdoms, and wishing with one accord to prevent even the shadow of misunderstanding which might be occasioned by doubts, misconceptions, or other causes of dispute between the Subjects on the Frontiers of the 2 Monarchies, especially in distant Countries as are those in America, have thought proper to settle, with all possible good faith, by a new Convention, the points which might one day or other, be productive of such inconveniences, as the experience of former times has very often shown.

To this end, the King of Great Britain has named the Most Noble and Most Excellent Lord, Francis Baron Osborne, of Kiveton, Marquis of Carmarthen, His Britannic Majesty's Privy Councillor, and Principal Secretary of State for the Department for Foreign Affairs, &c., &c., &c., and the Catholic King has likewise authorized Don Bernardo del Campo, Knight of the Noble Order of Charles the Third, Secretary of the same Order, Secretary of the Supreme Council of State, and his Minister

Plenipotentiary to the King of Great Britain: who having communicated to each other their respective Full Powers, prepared in due form, have agreed upon the following Articles:

ART. I. His Britannic Majesty's Subjects, and the other Colonists who have hitherto enjoyed the protection of England, shall evacuate the Country of the Mosquitos, as well as the Continent in general, and the Islands adjacent, without exception, situated beyond the Line hereinafter described, as what ought to be the Frontier of the extent of Territory granted by His Catholic Majesty to the English, for the uses specified in the IIIrd Article of the present Convention, and in addition to the Country already granted to them in virtue of the Stipulations agreed upon by the Commissaries of the 2 Crowns, in 1783.

II. The Catholic King, to prove, on his side, to the King of Great Britain, the sincerity of his sentiments of friendship towards His said Majesty and the British Nation, will grant to the English more extensive limits than those specified in the last Treaty of Peace: and the said limits of the Lands added by the present Convention shall for the future be understood in the manner following:

The English Line, beginning from the Sea, shall take the centre of the River Sibun or Jabon, and continue up to the source of the said River; from thence it shall cross in a straight line the intermediate land, till it intersects the River Wallis; and by the centre of the same River, the said Line shall descend to the point where it will meet the Line already settled and marked out by the Commissaries of the 2 Crowns in 1783: which limits, following the continuation of the said Line, shall be observed as formerly stipulated by the Definitive Treaty.

III. Although no other advantages have hitherto been in question, except that of cutting wood for dyeing, yet His Catholic Majesty, as a greater proof of his disposition to oblige the King of Great Britain, will grant to the English the liberty of cutting all other wood, without even excepting mahogany, as well as gathering all the fruits or produce of the earth, purely natural and uncultivated, which may, besides being carried away in their natural state, become an object of utility or of commerce, whether for food or for manufactures; but it is expressly agreed, that this Stipulation is never to be used as a pretext for establishing in that country any plantation of sugar, coffee, cocoa, or other like articles: or any fabric or manufacture by means of mills or other machines whatsoever, (this restriction however does not regard the use of saw-mills, for cutting or otherwise preparing the wood,) since all the Lands in question being indisputably acknowledged to belong of right to the Crown of Spain, no Settlements of that kind, or the Population which would follow, could be allowed.

The English shall be permitted to transport and convey all such wood, and other produce of the place, in its natural and uncultivated state, down the Rivers to the Sea, but without ever going beyond the limits which are prescribed to them by the Stipulations above granted, and without thereby taking an opportunity of ascending the said Rivers, beyond their bounds, into the countries belonging to Spain.

IV. The English shall be permitted to occupy the small Island known by the names of Casina, St. George's Key, or Cayo Casina, in consideration of the circumstance of that part of the coasts opposite to the said Island being looked upon as subject to dangerous disorders; but this permission is only to be made use of for purposes of real utility: and as great abuses, no less contrary to the intentions of the British Government than to the essential interests of Spain, might arise from this permission, it is here stipulated, as an indispensable condition, that no

Fortification, or work of defence whatever, shall at any time be erected there, nor any body of Troops posted, nor any piece of Artillery kept there; and in order to verify with good faith the accomplishment of this condition *sine quâ non* (which might be infringed by Individuals, without the knowledge of the British Government) a Spanish Officer or Commissary, accompanied by an English Commissary or Officer, duly authorized, shall be admitted, twice a year, to examine into the real situation of things.

V. The English nation shall enjoy the liberty of re-fitting their Merchant Ships in the southern triangle included between the point of Cayo Casina and the cluster of small Islands which are situated opposite that part of the coast occupied by the Cutters, at the distance of 8 leagues from the River Wallis, 7 from Cayo Casina, and 3 from the River Sibun, a place which has always been found well-adapted to that purpose. For which end, the edifices and storehouses, absolutely necessary for that service, shall be allowed to be built; but in this concession is also included the express condition of not erecting Fortifications there at any time, or stationing Troops, or constructing any military works; and in like manner it shall not be permitted to station any Ships of War there, or to construct an arsenal or other building, the object of which might be the formation of a naval establishment.

VI. It is also stipulated, that the English may freely and peaceably catch Fish on the coast of the Country assigned to them by the last Treaty of Peace, as also of that which is added to them by the present Convention; but without going beyond their boundaries, and confining themselves within the distance specified in the preceding Article.

VII. All the restrictions specified in the last Treaty of 1783, for the entire preservation of the right of the Spanish Sovereignty over the country, in which is granted to the English only the privilege of making use of the wood of the different kinds, the fruits and other produce, in their natural state, are here confirmed; and the same restrictions shall also be observed with respect to the new grant. In consequence, the Inhabitants of those Countries shall employ themselves simply in the cutting and transporting of the said wood, and in the gathering and transporting of the fruits, without meditating any more expensive Settlements, or the formation of any system of Government, either military or civil, further than such regulations as Their Britannic and Catholic Majesties may hereafter judge proper to establish, for maintaining peace and good order amongst their respective Subjects.

VIII. As it is generally allowed that the woods and forests are preserved, and even multiply, by regular and methodical cuttings, the English shall observe this maxim as far as possible; but if, notwithstanding all their precautions, it should happen, in course of time, that they were in want of dyeing-wood or mahogany, with which the Spanish Possessions might be provided, the Spanish Government shall make no difficulty to furnish a supply to the English at a fair and reasonable price.

IX. Every possible precaution shall be observed to prevent smuggling; and the English shall take care to conform to the regulations which the Spanish Government shall think proper to establish amongst their own Subjects, in all communications which they may have with the latter; on condition, nevertheless, that the English shall be left in the peaceable enjoyment of the several advantages inserted in their favour in the last Treaty, or stipulated by the Present Convention.

X. The Spanish Governors shall be ordered to give to the said English, dispersed, all possible facilities for their removal to the Settlements

agreed upon by the present Convention, according to the Stipulations of the VIth Article of the Definitive Treaty of 1783, with respect to the Country allotted for their use by the said Article.

XI. Their Britannic and Catholic Majesties, in order to remove every kind of doubt with regard to the true construction of the present Convention, think it necessary to declare that the conditions of the said Convention ought to be observed according to their sincere intention to ensure and improve the harmony and good understanding which so happily subsist at present between Their said Majesties.

In this view, His Britannic Majesty engages to give the most positive orders for the evacuation of the Countries above-mentioned, by all his Subjects, of whatever denomination; but if, contrary to such Declaration, there should still remain any Persons so daring as to presume, by retiring into the interior Country, to endeavor to obstruct the entire evacuation already agreed upon, His Britannic Majesty, so far from affording them the least succour, or even protection, will disavow them in the most solemn manner, as he will equally do those who may here after attempt to settle upon the Territory belonging to the Spanish Dominion.

XII. The evacuation agreed upon shall be completely effected within the space of 6 months after the exchange of the Ratifications of this Convention, or sooner if it can be done.

XIII. It is agreed that the new grants described in the preceding Articles, in favor of the English Nation, are to take place as soon as the aforesaid evacuation shall be entirely accomplished.

XIV. His Catholic Majesty, prompted solely by motives of humanity, promises to the King of England, that he will not exercise any act of severity against the Mosquitos, inhabiting in part the Countries which are to be evacuated, by virtue of the present Convention, on account of the connections which may have subsisted between the said Indians and the English; and His Britannic Majesty, on his part, will strictly prohibit all his Subjects from furnishing arms or war-like stores to the Indians in general, situated upon the Frontiers of the Spanish Possessions.

XV. The 2 Courts shall mutually transmit to each other Duplicates of the Orders which they are to dispatch to their respective Governors and Commanders in America, for the accomplishment of the present convention; and a Frigate, or proper Ship of War, shall be appointed on each side, to observe in conjunction that all things are performed in the best order possible, and with that cordiality and good faith of which the 2 Sovereigns have been pleased to set the example.

XVI. The present Convention shall be ratified by Their Britannic and Catholic Majesties, and the Ratifications exchanged, within the space of 6 weeks, or sooner if it can be done.

In witness whereof, we, the undersigned Ministers Plenipotentiary to Their Britannic and Catholic Majesties, in virtue of our respective Full Powers, have signed the present Convention, and have affixed thereto the Seals of our Arms.

Done at London, this 14th day of July 1786.

[L. S.] CARMARTHEN
[L. S.] LE CHEVR. DEL CAMPO.

DECLARATION.

At the time of exchanging our Sovereigns' Ratifications of the Convention signed the 14th of July last, we the Undersigned Ministers

Plenipotentiary have agreed, that the visit of the English and Spanish Commissaries, mentioned in the IVth Article of the said Convention with respect to the Island of Cayo Casina, is to extend in like manner to all the other places, whether in the Islands or on the Continent, where the English Cutters shall be situated.

In witness whereof, we have signed this Declaration, and affixed thereto the Seals of our Arms.

London, this 1st of September 1786.

[L. S.] CARMARTHEN.
[L. S.] LE MARQUIS DEL CAMPO.

4.—*President Monroe's message to Congress, March* 8, 1822.

[Extract.]

The revolutionary movement in the Spanish provinces in this hemisphere attracted the attention and excited the sympathy of our fellow citizens from its commencement.

This feeling was natural and honorable to them, from causes which need not be communicated to you. It has been gratifying to all to see the general acquiescence which has been manifested in the policy which the constituted authorities have deemed it proper to pursue in regard to this contest. As soon as the movement assumed such a steady and consistent form as to make the success of the provinces probable, the rights to which they were entitled by the laws of nations, as equal parties to a civil war, were extended to them. Each party was permitted to enter our ports with its public and private ships, and to take from them every article which was the subject of commerce with other nations. Our citizens also have carried on commerce with both parties, and the Government has protected it with each in articles not contraband of war. Through the whole of this contest the United States have remained neutral, and have fulfilled with the utmost impartiality all the obligations incident to that character.

This contest has now reached such a stage, and been attended with such decisive success on the part of the provinces, that it merits the most profound consideration whether their right to the rank of independent nations, with all the advantages incident to it in their intercourse with the United States, is not complete. Buenos Ayres assumed that rank by a formal declaration in 1816, and has enjoyed it since 1810, free from invasion by the parent country. The provinces composing the Republic of Colombia, after having separately declared their independence, were united by a fundamental law of the 17th of December, 1819. A strong Spanish force occupied at that time certain parts of the territory within their limits, and waged a destructive war. That force has since been repeatedly defeated, and the whole of it either made prisoners or destroyed, or expelled from the country, with the exception of an inconsiderable portion only which is blockaded in two fortresses.

The provinces on the Pacific have likewise been very successful. Chili declared her independence in 1818, and has since enjoyed it undisturbed; and of late, by the assistance of Chili and Buenos Ayres, the revolution has extended to Peru. Of the movement in Mexico our information is less authentic, but it is, nevertheless, distinctly understood that the new government has declared its independence, and that there

is now no opposition to it there, nor a force to make any. For the last three years the Government of Spain has not sent a single corps of troops to any part of that country; nor is there any reason to believe it will send any in future. Thus, it is manifest that all those provinces are not only in the full enjoyment of their independence, but, considering the state of the war and other circumstances, that there is not the most remote prospect of their being deprived of it.

When the result of such a contest is manifestly settled, the new governments have a claim to recognition by other powers which ought not to be resisted. Civil wars too often excite feelings which the parties cannot control. The opinion entertained by other powers as to the result may assuage those feelings, and promote an accommodation between them useful and honorable to both. The delay which has been observed in making a decision on this important subject will, it is presumed, have afforded an unequivocal proof to Spain, as it must have done to other powers, of the high respect entertained by the United States for her rights, and of their determination not to interfere with them. The provinces belonging to this hemisphere are our neighbors, and have successively, as each portion of the country acquired its independence, pressed their recognition by an appeal to facts not to be contested, and which they thought gave a just title to it.

To motives of interest this government has invariably disclaimed all pretension, being resolved to take no part in the controversy or other measures in regard to it which should not merit the sanction of the civilized world.

To other claims a just sensibility has been always felt and frankly acknowledged; but they in themselves could never become an adequate cause of action. It was incumbent on this government to look to every important fact and circumstance on which a sound opinion could be formed, which has been done. When we regard, then, the great length of time which this war has been prosecuted, the complete success which has attended it in favor of the provinces, the present condition of the parties, and the utter inability of Spain to produce any change in it, we are compelled to conclude that its fate is settled, and that the provinces which have declared their independence, and are in the enjoyment of it, ought to be recognized.

Of the views of the Spanish government on this subject no particular information has been recently received. It may be presumed that the successful progress of the revolution through such a long series of years, gaining strength and extending annually in every direction, and embracing, by the late important events, with little exception, all the dominions of Spain south of the United States on this continent, placing thereby the complete sovereignty over the whole in the hands of the people, will reconcile the parent country to an accommodation with them on the basis of their unqualified independence. Nor has any authentic information been recently received of the disposition of other powers respecting it. A sincere desire has been cherished to act in concert with them in the proposed recognition, of which several were some time past duly apprised; but it was understood that they were not prepared for it. The immense space between those powers, even those which border on the Atlantic, and these provinces make the movement an affair of less interest and excitement to them than to us. It is probable therefore that they have been less attentive to its progress than we have been. It may be presumed, however, that the late events will dispel all doubts of the result.

5.—*Observations of John Quincy Adams on the claim of Russia to territorial possessions on the continent of North America, communicated with Mr. Adams' letter to Mr. Middleton of July* 22, 1823.

[Extract.]

There can perhaps be no better time for saying frankly and explictly to the Russian Government that the future peace of the world and the interest of Russia herself cannot be promoted by Russian settlements upon any part of the American continent. With the exception of the British establishments north of the United States, the remainder of both the American continents must henceforth be left to the management of American hands.

It cannot possibly be the purpose of Russia to form extensive colonial establishments in America. The new American republics will be as impatient of a Russian neighbor as the United States; and the claim of Russia to territorial possessions extending to the fifty-first degree of north latitude is equally compatible with the British pretensions.

Mr. John Quincy Adams to Mr. Rush.

[Extract.]

No. 70.] DEPARTMENT OF STATE,
Washington, July 22, 1823.

SIR: * * * It is not imaginable that, in the present condition of the world, any European nation should entertain the project of settling a colony on the northwest coast of America. That the United States should form establishments there with views of absolute territorial right and inland communication, is not only to be expected, but is pointed out by the finger of nature, and has been for years a subject of serious deliberation in Congress. A plan has for several sessions been before them for establishing a territorial government on the borders of the Columbia River. It will undoubtedly be resumed at their next session, and even if then again postponed, there cannot be a doubt that in the course of a very few years it must be carried into effect.

* * * * * * *

The application of colonial principles of exclusion, therefore, cannot be admitted by the United States as lawful upon any part of the northwest coast of America, or as belonging to any European nation. Their own settlements there, when organized as territorial governments, will be adapted to the freedom of their own institutions, and, as constituent parts of the Union, be subject to the principles and provisions of their constitution. * * * * *

I have, &c.,

JOHN QUINCY ADAMS.

6.—*Mr. Rush to Mr. John Quincy Adams.*

No. 323.] LONDON, *August* 19, 1823. (Received October 9.)

SIR: When my interview with Mr. Canning, on Saturday, was about to close, I transiently asked him whether, notwithstanding the late news from Spain, we might not still hope that the Spaniards would get the better-

of all their difficulties. I had allusion to the defection of Ballasteros in Andalusia, an event seeming to threaten with new dangers the Constitutional cause. His reply was general, importing nothing more than his opinion of the increased difficulties and dangers with which, undoubtedly, this event was calculated to surround the Spanish cause.

Pursuing the topic of Spanish affairs, I remarked that should France ultimately effect her purposes in Spain, there was at least the consolation left that Great Britain would not allow her to go further and lay her hands upon the Spanish colonies, bringing them, too, under her grasp. I here had in my mind the sentiments promulgated upon this subject in Mr. Canning's note to the British ambassador at Paris of the 31st of March, during the negotiations that preceded the invasion of Spain. It will be recollected that the British Government say in this note that time and the course of events appeared to have substantially decided the question of the separation of these colonies from the mother country, although their formal recognization as independent states by Great Britain might be hastened or retarded by external circumstances, as well as by the internal condition of those new states themselves; and that as His Britannic Majesty disclaimed all intention of appropriating to himself the smallest portion of the late Spanish possessions in America, he was also satisfied that no attempt would be made by France to bring any of them under *her* dominion, either by conquest or by cession from Spain.

By this we are to understand, in terms sufficiently distinct, that Great Britain would not be passive under such an attempt by France, and Mr. Canning, on my having referred to this note, asked me what I thought my government would say to going hand in hand with this, in the same sentiment; not, as he added, that any concert in action under it could become necessary between the two countries, but that the simple fact of our being known to hold the same sentiment would, he had no douht, by its moral effect, put down the intention on the part of France, admitting that she should ever entertain it. This belief was founded, he said, upon the large share of the maritime power of the world which Great Britain and the United States shared between them, and the consequent influence which the knowledge that they held a common opinion upon a question on which such large maritime interests, present and future, hung, could not fail to produce upon the rest of the world.

I replied that in what manner my government would look upon such a suggestion I was unable to say, but that I would communicate it in the same informal manner in which he threw it out. I said, however, that I did not think I should do so with full advantage, unless he would at the same time enlighten me as to the precise situation in which His Majesty's Government stood at this moment in relation to those new states, and especially on the material point of their own independence.

He replied that Great Britain certainly never again intended to lend her instrumentality or aid, whether by mediation or otherwise, towards making up the dispute between Spain and her colonies, but that if this result could still be brought about she would not interfere to *prevent* it. Upon my intimating that I had supposed that all idea of Spain ever recovering her authority over the colonies had long since gone by, he explained by saying that he did not mean to controvert that opinion, for he, too, believed that the day had arrived when all America might be considered as lost to Europe so far as the tie of political dependence was concerned. All that he meant was, that if Spain and the colonies should still be able to bring the dispute, not yet totally extinct between

them, to a close upon terms satisfactory to both sides, and which should at the same time secure to Spain commercial or other advantages not extended to other nations, that Great Britain would not object to a compromise in this spirit of preference to Spain. All that she would ask would be to stand upon as favored a footing as any other nation after Spain. Upon my again alluding to the improbability of the dispute ever settling down now even upon this basis, he said that it was not his intention to maintain such a position, and that he had expressed himself as above rather for the purpose of indicating the feeling which this cabinet still had towards Spain in relation to the controversy than of predicting results.

Wishing, however, to be still more specifically informed, I asked whether Great Britain was at this moment taking any step, or contemplating any, which had reference to the recognition of these States, this being the point in which we felt the chief interest.

He replied that she had taken none whatever, as yet, but was upon the eve of taking one, not final, but preparatory, and which would still leave her at large to recognize or not, according to the position of events at a future period. The measure in question was to send out one or more individuals under authority from this government to South America, not strictly diplomatic, but clothed with powers in the nature of a commission of inquiry, and which in short he described as analogous to those exercised by our own commissioners in 1817, and that upon the result of this commission much might depend as to the ulterior conduct of great Britain. I asked whether I was to understand that it would comprehend all the new States, or which of them. To which he replied that for the present it would be limited to Mexico.

Reverting to his first idea, he again said that he hoped that France would not, should even events in the Peninsula be favorable to her, extend her views to South America for the purpose of reducing the colonies, nominally, perhaps, for Spain, but in effect to subserve ends of her own; but that, in case she should meditate such a policy, he was satisfied that the knowledge of the United States being opposed to it, as well as Great Britain, could not fail to have its influence in checking her steps. In this way he thought good might be done by prevention, and peaceful prospects all around increased. As to the form in which such knowledge might be made to reach France, and even the other powers of Europe, he said, in conclusion, that that might probably be arranged in a manner that would be free from objection.

I again told him that I would convey his suggestions to you for the information of the President, and impart to him whatever reply I might receive. My own inference rather is that his proposition was a fortuitous one; yet he entered into it, I thought, with some interest, and appeared to receive with a corresponding satisfaction the assurance I gave him that it should be made known to the President. I did not feel myself at liberty to express any opinion unfavorable to it, and was as careful to give none in its favor.

Mr. Canning mentioned to me, at this same interview, that a late confidential dispatch which he had seen from Count Nesselrode to Count Lieven, dated, I think, in June, contained declarations respecting the Russian ukase, relative to the northwest coast, that were satisfactory; that they went to show that it would probably not be executed in a manner to give cause of complaint to other nations, and that, in particular, it had not yet been executed in any instance under orders issued by Russia subsequently to its first promulgation.

I have, &c., RICHARD RUSH.

7.—*Mr. Rush to Mr. John Quincy Adams.*

No. 325.] LONDON, *August* 23, 1823. (Received October 9.)

SIR: I yesterday received from Mr. Canning a note, headed "private and confidential," setting before me, in a more distinct form, the proposition respecting South American affairs which he communicated to me in conversation on the 16th, as already reported in my number 323. Of his note I lose no time in transmitting a copy for your information, as well as a copy of my answer to it, written and sent this day.

In shaping the answer on my own judgment alone, I feel that I have had a task of some embarrassment to perform, and shall be happy if it receives the President's approbation.

I believe that this government has the subject of Mr. Canning's proposition much at heart, and certainly his note bears, upon the face of it, a character of cordiality towards the Government of the United States which cannot escape notice.

I have therefore thought it proper to impart to my note a like character and to meet the points laid down in his, as far as I could, consistently with other and paramount considerations.

These I conceived to be chiefly twofold: first, the danger of pledging my government to any measure or course of policy which might in any degree, now or hereafter, implicate it in the federative system of Europe; and, secondly, I have felt myself alike without warrant to take a step which might prove exceptional in the eyes of France, with whom our pacific and friendly relations remain, I presume, undisturbed, whatever may be our speculative abhorrence of her attack upon the liberties of Spain.

In framing my answer, I had also to consider what was due to Spain herself, and I hope that I have not overlooked what was due to the colonies.

The whole subject is open to views on which my mind has deliberated anxiously. If the matter of my answer shall be thought to bear properly upon the motives and considerations which belong most materially to the occasion, it will be a source of great satisfaction to me.

The tone of earnestness in Mr. Canning's note, and the force of some of his expressions, naturally start the inference that the British cabinet cannot be without its serious apprehensions that ambitious enterprises are meditated against the independence of the South American States. Whether by France alone I cannot now say on any authentic grounds.

I have, &c.,

RICHARD RUSH.

Mr. Canning to Mr. Rush.

Private and confidential.] FOREIGN OFFICE, *August* 20, 1823.

MY DEAR SIR: Before leaving town I am desirous of bringing before you in a more distinct, but still in an unofficial and confidential shape, the question which we shortly discussed the last time that I had the pleasure of seeing you.

Is not the moment come when our governments might understand each other as to the Spanish-American colonies? And if we can arrive at such an understanding, would it not be expedient for ourselves, and beneficial for all the world, that the principles of it should be clearly settled and plainly avowed?

For ourselves we have no disguise.

1. We conceive the recovery of the colonies by Spain to be hopeless.

2. We conceive the question of the recognition of them, as independent states, to be one of time and circumstances.

3. We are, however, by no means disposed to throw any impediment in the way of an arrangement between them and the mother country by amicable negotiation.

4. We aim not at the possession of any portion of them ourselves.
5. We could not see any portion of them transferred to any other power with indifference.

If these opinions and feelings are, as I firmly believe them to be, common to your government with ours, why should we hesitate mutually to confide them to each other, and to declare them in the face of the world?

If there be any European power which cherishes other projects, which looks to a forcible enterprise for reducing the colonies to subjugation, on the behalf or in the name of Spain, or which meditates the acquisition of any part of them to itself, by cession or by conquest, such a declaration on the part of your government and ours would be at once the most effectual and the least offensive mode of intimating our joint disapprobation of such projects.

It would at the same time put an end to all the jealousies of Spain with respect to her remaining colonies, and to the agitation which prevails in those colonies, an agitation which it would be but humane to allay, being determined (as we are) not to profit by encouraging it.

Do you conceive that, under the power which you have recently received, you are authorized to enter into negotiation, and to sign any convention upon this subject? Do you conceive, if that be not within your competence, you could exchange with me ministerial notes upon it?

Nothing could be more gratifying to me than to join with you in such a work, and I am persuaded there has seldom, in the history of the world, occurred an opportunity when so small an effort of two friendly governments might produce so unequivocal a good, and prevent such extensive calamities.

I shall be absent from London but three weeks at the utmost, but never so far distant but that I can receive and reply to any communication within three or four days.

I have, &c.,

GEORGE CANNING.

Mr. Rush to Mr. Canning.

LONDON, *August* 23, 1823.

MY DEAR SIR: Your unofficial and confidential note of the 20th instant reached me yesterday, and has commanded from me all the reflection due to the interest of its subject and to the friendly spirit of confidence upon which it is so emphatically founded.

The Government of the United States having, in the most formal manner, acknowledged the independence of the late Spanish provinces in America, desires nothing more anxiously than to see this independence maintained with stability, and under auspices that may promise prosperity and happiness to these new states themselves, as well as advantage to the rest of the world. As conducing to these great ends, my government has always desired, and still desires, to see them received into the family of nations by the powers of Europe, and especially, I may add, by Great Britain.

My government is also under a sincere conviction that the epoch has arrived when the interests of humanity and justice, as well as all other interests, would be essentially subserved by the general recognition of these states.

Making these remarks, I believe I may confidently say, that the sentiments unfolded in your note are fully those which belong also to my government.

It conceives the recovery of the colonies by Spain to be hopeless.

It would throw no impediment in the way of an arrangement between them and the mother country, by amicable negotiation, supposing an arrangement of this nature to be possible.

It does not aim at the possession of any portion of those communities for or on behalf of the United States.

It would regard as highly unjust and fruitful of disastrous consequences any attempt on the part of any European power to take possession of them by conquest, or by cession, or on any ground or pretext whatever

But in what manner my government might deem it expedient to avow these principles and feelings, or express its disapprobation of such projects as the last, are points which none of my instructions, or the power which I have recently received, embrace; and they involve, I am forced to add, considerations of too much delicacy for me to act upon them in advance.

It will yield me particular pleasure to be the organ of promptly causing to be brought under the notice of the President the opinions and views of which you have made me the depositary upon this subject, and I am of nothing more sure than that he will fully appreciate their intrinsic interest, and not less the frank and friendly feelings towards the United States in which they have been conceived and communicated to me on your part.

Nor do I take too much upon myself when I anticipate the peculiar satisfaction the

President will also derive from the intimation which you have not scrupled to afford me as to the just and liberal determinations of His Majesty's Government in regard to the colonies which still remain to Spain.

With a full reciprocation of the personal cordiality which your note also breathes, and begging you to accept the assurances of my great respect, I have, &c.,

RICHARD RUSH.

8.—*President Monroe's message to Congress December* 2, 1823.

[Extract.]

At the proposal of the Russian Imperial Government, made through the minister of the Emperor residing here, a full power and instructions have been transmitted to the minister of the United States at St. Petersburg to arrange by amicable negotiation the respective rights and interests of the two nations on the northwest coast of this continent. A similar proposal has been made by His Imperial Majesty to the Government of Great Britain, which has likewise been acceded to. The Government of the United States has been desirous by this friendly proceeding of manifesting the great value which they have invariably attached to the friendship of the Emperor, and their solicitude to cultivate the best understanding with his government.

In the discussions to which this interest has given rise, and in the arrangements by which they may terminate, the occasion has been judged proper for asserting as a principle, in which the rights and interests of the United States are involved, that the American continents, by the free and independent condition which they have assumed and maintained, are henceforth not to be considered as subjects for future colonization by any European powers.

* * * * * * *

The late events in Spain and Portugal show that Europe is still unsettled. Of this important fact no stronger proof can be adduced than that the allied powers should have thought it proper on any principle satisfactory to themselves to have interposed by force in the internal concerns of Spain. To what extent such interposition may be carried, on the same principle, is a question in which all independent powers whose governments differ from theirs are interested, even those most remote, and surely none more so than the United States.

Our policy in regard to Europe, which was adopted at an early stage of the wars, which have so long agitated that quarter of the globe, nevertheless remains the same, which is not to interfere in the internal concerns of any of its powers; to consider the government *de facto* as the legitimate government for us; to cultivate friendly relations with it, and to preserve those relations by a frank, firm, and manly policy, meeting, in all instances, the just claims of every power, submitting to injuries from none. But in regard to these continents, circumstances are eminently and conspicuously different. It is impossible that the allied powers should extend their political system to any portion of either continent without endangering our peace and happiness, nor can any one believe that our southern brethren, if left to themselves, would adopt it of their own accord. It is equally, impossible, therefore that we should behold such interposition, in any form, with indifference. If we look to the comparative strength and resources of Spain and those new governments, and their distance from each other, it must be obvious that she can never subdue them. It is still the true policy of the United States to leave the parties to themselves, in the hope that other powers will pursue the same course.

9.—*Mr. Rush to Mr. Middleton.*

[Extract.]

LONDON, *January* 9, 1824.

I have heretofore written to you on the 6th and 22d of December, and have now to inform you that from interviews which I have had with Mr. Canning, since the present month set in, I find that he will decline sending instructions to Sir Charles Bagot to proceed jointly with our government and that of Russia, in the negotiation relative to the northwest coast of America; but that he will be merely informed that it is now the intention of Great Britain to proceed separately.

Mr. Canning intimated to me that to proceed separately was the original intention of this government, to which effect Sir Charles Bagot had been instructed and never to any other, and that Sir Charles had only paused under your suggestions to him of its being the desire of our government that the three powers should move in concert at St. Petersburg upon this subject.

The resumption of its original course by this government has arisen chiefly from the principle which our government has adopted, of not considering the American continents as subjects for future colonization by any of the European powers, a principle to which Great Britain does not accede.

I have informed the Secretary of State of the above intention of this government. It will produce no alteration in my endeavors to obtain in negotiation here a settlement of the points as between the United States and Great Britain, respecting the northwest coast, in manner as my instructions lay them down to me.

10.—*Mr. Rush to Mr. John Quincy Adams.*

[Extract.]

LONDON, *August* 12, 1824.

SIR: * * * It is proper now, as on the question of the St. Lawrence, that I should give you faithful information of the manner in which the British plenipotentiaries received my proposal, and the principles under which I had introduced it. I may set out by saying, in a word, that they totally declined the one and totally denied the other. They said that Great Britain considered the whole of the unoccupied parts of America as being open to her future settlements in like manner as heretofore. They included within these parts as well that portion of the northwest coast lying between the forty-second and the fifty-first degrees of latitude as any other parts. The principle of colonization on that coast, or elsewhere on any portion of those continents not yet occupied, Great Britain was not prepared to relinquish. Neither was she prepared to accede to the exclusive claim of the United States. She had not, by her convention with Spain in 1790, or at any other period, conceded to that power any exclusive rights on that coast where actual settlements had not been formed. She considered the same principles applicable to it now as then. She could not concede to the United States, who held the Spanish title, claims which she had felt herself obliged to resist when advanced by Spain, and on her resistance to which the credit of Great Britain had been thought to depend.

* * * * * * *

I have, &c.,

RICHARD RUSH.

11.—*Treaty of amity, commerce, and navgiation between Great Britain and Mexico. Signed at London, December* 26, 1826.

[Extract.]

XIV. The subjects of his Britannic Majesty shall, on no account or pretext whatsoever, be disturbed or molested in the peaceable possession and exercise of whatever rights, privileges, and immunities they have at any time enjoyed within the limits prescribed and laid down in a convention signed between his said majesty and the King of Spain on the 14th of July, 1786; whether such rights, privileges, and immunities shall be derived from the stipulations of the said convention or from any other concession which may at any time have been made by the King of Spain or his predecessors to British subjects and settlers residing and following their lawful occupations within the limits aforesaid, the two contracting parties reserving, however, for some more fitting opportunity, the further arrangements on this article.

12.—*Treaty between the United States and New Granada of December* 12, 1846.

[Extract.]

ARTICLE XXXV.

The United States of America and the Republic of New Granada, desiring to make as durable as possible the relations which are to be established between the two parties by virtue of this treaty, have declared solemnly and do agree to the following points:

1st. For the better understanding of the preceding articles, it is and has been stipulated between the high contracting parties that the citizens, vessels, and merchandise of the United States shall enjoy in the ports of New Granada, including those of the part of the Granadian territory generally denominated *Isthmus of Panama*, from its southernmost extremity until the boundary of Costa Rica, all the exemptions, privileges, and immunities concerning commerce and navigation which are now or may hereafter be enjoyed by Granadian citizens, their vessels and merchandise; and that this equality of favors shall be made to extend to the passengers, correspondence, and merchandise of the United States in their transit across the said territory from one sea to the other. The government of New Granada guarantees to the government of the United States that the right of way or transit across the *Isthmus of Panama*, upon any modes of communication that now exist or that may be hereafter constructed, shall be open and free to the government and citizens of the United States, and for the transportation of any articles of produce, manufactures, or merchandise, of lawful commerce, belonging to the citizens of the United States; that no other tolls or charges shall be levied or collected upon the citizens of the United States, or their said merchandise thus passing over any road or canal that may be made by the government of New Granada, or by the authority of the same, than is, under like circumstances, levied upon and collected from the Granadian citizens; that any lawful produce, manufactures, or merchandise belonging to citizens of the United States thus passing from one sea to the other, in either direction, for the pur-

pose of exportation to any other foreign country, shall not be liable to any import duties whatever; or, having paid such duties, they shall be entitled to drawback upon their exportation; nor shall the citizens of the United States be liable to any duties, tolls, or charges of any kind to which native citizens are not subjected for thus passing the said isthmus. And, in order to secure to themselves the tranquil and constant enjoyment of these advantages, and as an especial compensation for the said advantages, and for the favors they have acquired by the 4th, 5th, and 6th articles of this treaty, the United States guarantee positively and efficaciously to New Granada, by the present stipulation, the perfect neutrality of the before-mentioned isthmus, with the view that the free transit from the one to the other sea may not be interrupted or embarrassed in any future time while this treaty exists; and, in consequence, the United States also guarantee, in the same manner, the rights of sovereignty and property which New Granada has and possesses over the said territory.

13.—*Convention between the United States and Nicaragua, June* 21, 1849 (*concluded but not submitted to the Senate in consequence of the subsequent conclusion of the Clayton-Bulwer Treaty*).

The United States of America and the State of Nicaragua, having in view the grand design of opening and establishing through the territories of the latter State a passage and communication between the Caribbean Sea and the Pacific Ocean to facilitate the commerce between the two oceans and to produce other great results, and designing to establish, regulate, and define the grants, rights, privileges, and immunities that shall appertain to each other with reference to such great object by means of a treaty and special convention. For the accomplishment of these desirable purposes the President of the United States of America has conferred full powers on Elijah Hise, chargé d'affaires of the government of said States in Central America, and the State of Nicaragua hath likewise granted full powers to Sr. Lic^{do} Don Bueneventura Selva, chargé d'affaires of the government of the said State of Nicaragua near the United States legation in Central America, who, after having exchanged their said full powers in due and proper form, have agreed and do agree upon the following articles:

ARTICLE I.

It is solemnly agreed between the two high contracting parties that the State of Nicaragua doth grant to and confer upon the United States of America, or to a company of the citizens thereof, the exclusive right and privilege to make, construct, and build within the territories of the said State of Nicaragua, through or by the use and means of any of the streams, rivers, bays, harbors, lakes, or lands under the jurisdiction or within the limits of the said State, a canal or canals, a road or roads, either railways or turnpikes or any other kind of roads, for the purpose of opening a convenient passage and communication, either by land alone, or water alone, or by both land and water, and by means, if deemed proper, of locks and dams, or by any other mode of overcoming and removing the obstructions to the navigation of the said rivers, lakes, harbors, &c., between the Caribbean Sea and the Pacific Ocean, for the transit and and passage of ships, steamers, sailing-vessels, boats, and vessels of all

kinds, as well as vehicles of every sort used for the transportation and conveyance of persons and property and of goods, wares, and merchandise of every description, and the United States or the company which may be formed by virtue of such charter as shall be made as herein provided shall be permitted for the construction of said works to procure, take, and obtain within the territories of Nicaragua all kinds of materials, such as stone, timber, earths, and whatever else may be necessary and proper for the said purposes, free of any charge so far as the said materials may be procured on the lands belonging to said State.

ARTICLE II.

The State of Nicaragua cedes and grants to the United States, or to a chartered company of the citizens thereof, as the case may be, absolutely, all the land that may be required for the location and construction of said canal or canals, road or roads, and which may be necessary for the erection of buildings and houses of every description for the residence and accommodation of the engineers, superintendents, and laborers, and all others employed in the making and construction of the said works, or in governing, managing and controlling the same, and also for the erection of all such necessary buildings as may be requisite and proper for the purpose of storing away therein all the tools, machines, materials, and property of every description which may be required for the use in the construction, repairing, preservation, and management of said works, and should any portion of the lands or materials, or of the rivers, bays, ports, or their coasts or lakes, and their shores, which may be necessary and proper to be applied for the location and construction of said works and its appurtenances, belong to individuals, the State of Nicaragua agrees and undertakes to extinguish the titles thereto, and to procure the same upon a just principle of valuation for the aforesaid public works. The aforesaid cession and grant shall include a space of not less than three hundred feet on each side of the lines of said works, and extending all along the whole length thereof, so that ample space be secured on the margins of said works for the convenient use thereof. The just value of such of said lands and materials as may be private property at the date of this treaty will be paid for by said company.

ARTICLE III.

It is agreed that if the Government of the United States shall decide not to undertake and construct the said works, then either the President or Congress thereof shall have the power and authority to frame, enact, and issue a charter or act of incorporation containing such liberal provisions, and such grants of rights and privileges, not inconsistent with the rights of the contracting parties herein secured, as may be necessary, convenient and proper to effect the great objects in view, which charter and act of incorporation shall provide as follows:

1st. That the company which may be formed and organized under and by virtue of its provisions shall be composed exclusively of the citizens of one or both of the contracting parties, who may subscribe for and become the owners of the *whole* of the capital stock required for the said works. If, however, such citizens (thus having the preference) shall fail in due time to subscribe for and become the owners of the whole amount of the said capital stock, the residue thereof not taken by them may be taken, paid in, and owned by the governments of both or either of the contracting parties, or by the governments or citizens of any other nation, kingdom, or country.

2d. That said company shall have the sole and exclusive right and privilege of constructing and owning such works as are herein named within the State of Nicaragua, provided the same are commenced and prosecuted within the time limited in this convention.

3d. It shall authorize the said company to build and construct said canal or canals, in such directions and of such width and depth as they shall in their discretion determine, and if the plan of roads is in part or in whole adopted the route, width, kind, and number thereof shall be determined upon by the said company as they may think proper.

4th. It shall provide that said company may make contracts, sue, and be sued as a corporation, with a given name and style, have a corporate seal, and engage in all such trade and business as may be proper and convenient in promoting all the operations required for the attainment of the ends in view.

5th. It shall contain provisions adequate for the organization of said company; it shall provide for the appointment of the officers, agents, engineers, surveyors, superintendents, and other employés of said company; and that said company may make and adopt all its own by-laws and regulations, so that the same be not in conflict with the provisions of this convention.

6th. It shall provide that said company may not only build and construct, but also enlarge, alter, repair, and reconstruct the said works as they may think proper, and that they may manage and govern the same and manage and control the financial affairs of the corporation.

7th. It shall provide that the said company shall make annual reports to the executive governments of the United States and the State of Nicaragua, setting forth their receipts and expenditures, and the condition, operations, and affairs of the said company.

8th. It shall provide that the management of the affairs of said company shall be vested and lodged in nine managers, five of whom shall be appointed by the company for a period of time, and in a manner to be regulated by the said charter, and in like manner two of the said managers shall be appointed by the President of the United States and two by the Executive Chief of the State of Nicaragua, and the said nine managers shall appoint their own president.

9th. It shall provide that the governments of either of the contracting parties may, through their committees, freely examine and investigate the affairs, business operations, and condition, financial and otherwise, of the said company, and for such purpose such committees may examine the books and papers of the company, and examine the officers thereof and other witnesses on oath, and make reports thereon to their respective governments.

10th. It shall provide that said company shall have the sole and exclusive right and privilege of conveying persons and passengers, and of conveying all steamers, ships, and vessels of all kinds, by towage or otherwise, and of transporting in the vessels of others or of their own all property, goods, wares, and merchandise, over, through, and upon said navigable waters, canal or canals, road or roads, which shall be improved, made, or constructed by them, at such rates, charges, duties, and tolls as the said company may think proper to establish; except, however, that the said charter shall further provide that all the vessels of war and all other public vessels of every description belonging to the governments of the two contracting parties, as well also as all other vessels which may be engaged in the permanent or temporary employment of the said governments to transport their troops, munitions of war, their public property of all kinds, and to convey their public agents, consuls,

ministers, and all their officers, civil and military, shall be permitted to have the free and unrestricted use of the said canal or canals and navigable waters, and shall if necessary and required be conveyed through the same by the said company free of all costs and charge; said charter shall further provide also that the public mails of the contracting parties shall be conveyed and transported along and over the said works by the said company, in their own vessels or vehicles, free of cost or charge, and the contracting parties agree and stipulate with all solemnity that the aforesaid rights and privileges shall be enjoyed by each other perpetually, and that said charter shall provide accordingly; said charter shall also further provide that the citizens of the two parties shall enjoy and possess the right and privilege with their vessels, goods, merchandise, and property, and persons to pass and be conveyed through, upon, and over the said canals, roads, and navigable waters on terms at least as favorable as the subjects or citizens of any other nation or country.

11th. Said charter shall provide that the said works shall be commenced by said company within ten years after it shall be fully organized under said charter, or otherwise forfeit their privileges; so likewise if they shall after said works are begun declare their intention to abandon them and cease to prosecute the same for four entire successive years intentionally.

ARTICLE IV.

The charter aforesaid may contain such other provisions and grants of rights and privileges not in violation of or in conflict with any of the preceding or subsequent articles of this treaty as may be deemed necessary, convenient, or proper for the objects in view by either the President or Congress of the United States, and the same when framed and issued shall be approved and legalized by the Government of the State of Nicaragua, and no privileges or emoluments shall be granted in said charter to either of the contracting parties which shall not likewise be held and enjoyed to the same extent by the other.

ARTICLE V.

The Government of the United States shall have the right to erect such forts and fortifications at the ends and along the lines of said works, and to arm and occupy the same in such manner and with as many troops as may be deemed necessary by the said government for the protection and defense thereof, and also for the preservation of the peace and neutrality of the territories of Nicaragua, to whom pertains equal rights as inherent to her sovereignty.

ARTICLE VI.

The public armed vessels, letters of marque, and privateers, and the private merchant and trading vessels belonging either to the governments, or the subjects, or citizens of nations, kingdoms, or countries with which either of the contracting parties may be at war, shall not, during the continuance of such war, be suffered or allowed to come in the ports at the terminations of said canals nor be allowed to pass on or through the same, on any account whatever; neither shall the vessels of neutral nations, whether public or private, be allowed to convey by means of said canal articles contraband of war, to or for the enemies of either of the contracting parties, or to or for other nations or states who may be

at war with each other; nor shall the vessels of countries which are engaged in war with each other, owned or employed and armed by them to carry on such war, during the continuance be allowed to pass through the said canals. The public and private vessels of all nations, kingdoms, and countries which are in peace with both the contracting parties and with each other shall be permitted to enter said ports, and to pass or be conveyed through the said canals, but they shall be subject, however, to the payment of such duties, charges, and tolls as may be established by the proprietors of the said works.

Article VII.

The State of Nicaragua may, of course, exercise her right of erecting and establishing anywhere on the routes or margins, or at the points of termination of said works, custom-houses and warehouses, and to collect duties, according to her own laws, upon the goods, wares, and merchandise imported for sale or consumption into her territories by means of said works, and the State of Nicaragua may adopt and enforce all needful rules and regulations to prevent smuggling or the introduction of contraband goods in her territories; but it is expressly agreed that the State of Nicaragua shall not impose, enforce, or collect any taxes, charges, or duties of any kind or amount on the persons (for passports), or property, or on goods, wares, or merchandise of any class or kind on their travel or transit over, or for passing through her territories by means of said canals, roads, &c., provided the said property, goods, wares, and merchandise shall be not sold or not introduced for sale or consumption into the said State, but be exported to other states or countries.

Article VIII.

The ports at the points of termination of said works shall be free to both the contracting parties and their citizens, respectively; and their public and private vessels of all kinds shall enter and remain therein and depart therefrom and not be subjected to the payment of any port charges, tonnage duties, or other imposition whatever.

Article IX.

The persons employed in the location and construction of said works, the owners thereof, and all their agents, and officers, and employés of every sort, shall be under the special protection of the governments of both the contracting parties, and they shall not be subject to any kind of taxation on their persons or property, nor shall they be required to pay any contributions or to perform any civil or military duty or service whatever for either of the two governments during their employment about the said works; and all provisions, including wines and liquors, and all merchandise imported into Nicaragua for their clothing and subsistence shall be free and exempt from all duties and taxes, direct or indirect; and all such articles, property, stores, tools, implements, and machines, &c., &c., as may be required for surveys and explorations, and for locating and constructing said works, shall be imported into the State of Nicaragua free from all taxes and duties whatever thereon, and the vessels employed in the importation of the said subsistence, clothing, tools, implements, &c., &c., shall also be free and exempt from all port charges and tonnage duties in all the ports, rivers, lakes, or harbors on the coasts or within the limits of the State of Nicaragua; and entire

liberty is to be enjoyed by the said company to make full and complete surveys and explorations of the ports, bays, seas, lakes, rivers, and territories of Nicaragua, in order to the location of said works and for the procurement of lands and materials necessary for the same, in which explorations and surveys Nicaragua, at her own expense, may participate, if she thinks proper.

ARTICLE X.

The State of Nicaragua grants and cedes to the United States or to a company to be chartered as herein provided, as the case may be, all the land within two leagues square belonging to the said State, and which may be unappropriated at the date of this treaty, at each point of the terminations of said works at the seas on each side, that is to say, three miles square on each side of both ends of said works, to serve for the sites of two free cities which it is anticipated will hereafter be established at said points, the inhabitants of which free cities shall enjoy the following rights and immunities:

1st. They shall govern themselves by means of their own municipal government, to be administered by officers, legislative, executive, and judicial, chosen and elected by themselves according to their own regulations.

2d. They shall have the right of trial by jury in their own city courts.

3d. They shall have the most perfect freedom of religious belief and of religious worship, public and private.

4th. They shall not be required to pay any tax upon their real estate or other property except such as may be imposed by the municipality and collected for the city treasury, and to be used and applied for the benefit of said cities.

5th. They shall not be required to perform any military services, except for the defense of the said cities in which they may reside.

6th. The said cities will of course be under the qualified dominion and government of the State of Nicaragua, not to be exercised in any manner, however, in violation of their rights and immunities as herein specified; and said free cities shall be under the protection of the governments of both the contracting parties.

ARTICLE XI.

The State of Nicaragua agrees that the United States shall have, possess, and enjoy forever the following rights and privileges; that is to say, the right and privilege to pass, convey, transport, and send through all or any part of the territories and dominions of the State of Nicaragua, on land or water, from ocean to ocean, by means of her ports, bays, rivers, lakes, and roads, troops, infantry or cavalry, all kinds of arms, artillery, and munitions of war of all kinds, her public property of every description, public officers, civil and military, consuls, ministers, dispatch agents, her public mail and mail agents, and all other employés of the Government of the United States of America; and the same shall all and each be permitted to pass, be sent, and be conveyed through said state, in any manner, as aforesaid, in the public armed vessels of the United States, and in all such other vessels or vehicles, public or private, which may be in the temporary or permanent employment of the Government of the United States for any of the purposes aforesaid, or in any other way, free from all cost and exempt from all taxes, duties, imposts, charges, or exactions of any kind whatever, either on the persons, property, vehicles, or vessels aforesaid; and all the

aforesaid privileges and the said free rights of way and of transit shall be held, used, and enjoyed by the United States of America (but not by any other nation, state, or government, except Nicaragua) without cost or charge, and freely, whether the same be made through the dominions and territories of Nicaragua as they now exist, or whether the said troops, munitions of war, public officers, agents, employés, mails, public property, vehicles, and vessels, &c., shall be sent, transported, or conveyed by means of improved navigable rivers, canals, or turnpikes, or railroads, or any other public improvements which may be hereafter made in the State of Nicaragua, either by the governments or citizens of the contracting parties, or by the governments, citizens, or people of any other nation, kingdom, or country; and the citizens of the United States shall have and enjoy all the rights and privileges of travel, passage, transit, and conveyance for themselves and their property and vessels of all kinds through the territories and dominions of the State of Nicaragua as they now exist or through such canals or roads, railways or turnpikes, or other improvements as may be hereafter made in said state, upon terms and conditions in every particular as favorable as those enjoyed by the citizens of Nicaragua, or by the citizens of any other nation, kingdom, or country.

ARTICLE XII.

In consideration of the premises as set forth in the foregoing eleven articles, the United States of America doth solemnly agree and undertake to protect and defend the State of Nicaragua in the possession and exercise of the sovereignty and dominion of all the country, coasts, ports, lakes, rivers, and territories that may be rightfully under the jurisdiction and within the just and true limits and boundaries of the said state; and when the circumstances and condition of the country may require it the United States shall employ their naval and military force to preserve the peace and maintain the neutrality of the said coasts, ports, lakes, rivers, and territories, and to hold and keep the same under the dominion and sovereignty of the Government of the State of Nicaragua or of the government of such state or political community of which Nicaragua may voluntarily become a member, or with which, of her own accord, she may hereafter be identified: Provided, however, that the said sovereignty and dominion of the State of Nicaragua, so guaranteed as above, shall not be held, maintained, or exercised by said state in any such manner as to conflict or to be inconsistent with the rights and privileges herein secured to the United States and her citizens; and to prevent all misunderstanding, it is expressly stipulated that the United States are not bound, nor do they undertake, to aid, assist, or support Nicaragua in offensive wars or wars of aggression waged and carried on by said state with foreign powers or with the neighboring states, outside of her just limits, and beyond the territories rightfully within her jurisdiction; but the contracting parties agree and undertake that, if necessary, the naval and military forces and the entire means and resources of both the contracting parties shall be employed to put down all wars and bloodshed arising therefrom, and to suppress all violations of the peace and interruptions of the neutrality of the said State of Nicaragua; and for further explanation it is understood that if the State of Nicaragua should become involved in a war with any foreign power or neighboring state within her own borders, to defend the territories rightfully belonging to her, or to recover such territories wrongfully wrested from her, the United States engages to defend Nicaragua in carrying on such war within her own rightful limits, provided, how

ever, that such war is just, and provided, moreover, that if peace is prevailing in the State of Nicaragua, no wars or hostilities shall be first commenced in said state by either of the contracting parties without previous friendly consultations, and unless with the consent of both their governments, given according to their laws and constitutions, respectively.

ARTICLE XIII.

The contracting parties, in negotiating this treaty, have had in view the contract entered into between the State of Nicaragua, through their commissioner, José Trinidad Muños, and a certain company styled "Compania de transito de Nicaragua," composed of certain persons named Willard Parker, Simeon H. Ackerman, Asher Kurshecdt, and David J. Brown, through the said David J. Brown as their agent, which contract was executed and signed by said commissioner and agent on March 14, 1849, and ratified by the legislative power of the State of Nicaragua on March 16, 1849, and approved by the executive power of said state on the 17th of March, 1849. Now, in view of this contract, it is further agreed as follows:

1st. If the above-named company shall accede to this treaty *in all its parts*, or if they shall voluntarily abandon their contract, or if they shall forfeit their rights under said contract by failing to perform and execute the terms and conditions thereof in due time, then this treaty shall remain and be valid in all its parts.

2d. But if the said company shall not accede to this treaty *in all its parts*, and if they shall not abandon or forfeit their said contract, but if they shall execute the same and comply with its terms, and build the said works all in the time required, then, in such case, this treaty in all its parts, wherein the State of Nicaragua grants to the United States, or to a company to be chartered by the President or Congress thereof, the exclusive privilege to be the constructors and owners of said works, shall be void, and of no force or effect.

3d. Nevertheless, in such case as is set forth in the second section next preceding, if said company shall accede to the fifth (5th), the sixth (6th), the eighth (8th), and the eleventh (11th) articles of this treaty, and shall consent and agree that the United States of America, and the citizens thereof, shall have and enjoy all the rights and privileges therein granted to them, and as defined also in the tenth (10th) section of the third (3rd) article, then in such case the above-named fifth (5th), sixth (6th), eighth (8th), and eleventh (11th) articles of this treaty, as also the twelfth (12th) article thereof, shall be valid and obligatory between the contracting parties.

4th. But if in such case existing as is set forth in the second section above the said company shall refuse to accede or agree to the said fifth (5th), sixth (6th), eighth (8th), and eleventh (11th) articles hereof, as specified in the preceding third section, then this treaty shall be altogether void and of no force or effect whatever.

But the contracting parties, anticipating that said company, being satisfied that the great enterprise in view cannot succeed unless under the protection and patronage of the two governments, will concur and co-operate with them in the promotion thereof, they are assured that this treaty will meet their cordial approbation, and that it will be fully acceded to by them.

The present special convention between the United States of America and the State of Nicarauga shall be approved and ratified by the President of the United States of America, by and with the advice and con-

sent of the Senate thereof, and by the Director of the State of Nicaragua, with the consent of the Legislative Chambers thereof, and the ratifications shall be exchanged in the city of Washington, Santiago de Managua or Leon, within the term of two years counting from this date.

In faith whereof, we, the plenipotentiaries of the United States of America and of the State of Nicaraugua, have signed and sealed these presents in the city of Guatemala, on the twenty-first day of June, in the year of our Lord, one thousand eight hundred and forty-nine, in the seventy-third year of the independence of the United States of America, and in the twenty-eighth year of the independence of the State of Nicaragua.

[SEAL.] ELIJAH HISE.
[SEAL.] BUENAVA SELVA.

14.—*Contract between Nicaragua and the American Atlantic and Pacific Ship-Canal Company, signed at Leon, August 27, 1849, containing the grant which was subsequently accepted under Article VII of the Clayton-Bulwer Treaty.*

The Supreme Director of the State of Nicaragua, and "The American Atlantic and Pacific Ship-Canal Company," composed of Cornelius Vanderbilt, Joseph L. White, Nathaniel H. Wolfe, and their associates, being always citizens of The United States, desiring to settle the terms of a contract for facilitating the transit across the Isthmus of Nicaragua from the Atlantic to the Pacific Oceans, by means of a ship-canal or railroad, have appointed as Commissioners on the part of the Supreme Director of the State of Nicaragua, Messrs. Hermenegilda Zepeda and Gregorio Juares, and on the part of the said company Mr. David L. White, with full powers to arrange and conclude a contract for the above-named purposes; which Commissioners having exchanged their respective powers, have agreed upon and concluded the following Articles:

ART. I. The State of Nicaragua grants to the said Company the exclusive right and privilege of constructing a ship-canal across its territory, by a single route, and at its own expense, from the port of St. John's of Nicaragua, or any other more feasible point on the Atlantic, to the port of Realejo, Gulf of Amapala, or Fonseca, Tamorinda, St. John's of the South, or any other point on the Pacific Ocean which the engineers of the Company may decide upon, by means of the St. John's river, Lake Nicaragua, River Tipitapa, Lake of Leon, or any other rivers, lakes, waters, and lands situated within its territory, with the object of connecting the two oceans, and to make use of, for its construction and navigation, said rivers, lakes, waters, and lands, both public and private. And the State also grants to the Company the exclusive right to the administration, management, and control of the said canal, according to the following Articles:

II. The dimensions of the canal shall be such as may be necessary for the passage of vessels of all sizes, and the point at which it shall terminate on the Pacific, in the event that the engineers of the Company shall decide upon two or more points as equally practicable, shall be that one most consistent with the mutual interests both of the State and the Company.

III. The Company binds itself to construct, at its own expense, in the harbors at the extremities of the route of said canal, custom-house buildings of the necessary capacity for the use of the State and Company.

IV. The exclusive rights and privileges herein granted to the said Company by the said State, shall be enjoyed by the same for the fixed period of 85 years, counted from the day in which the canal shall be completed and put in use.

V. The Company hereby agrees to pay to the said State for the said grant the following sums of money, namely:

First. Ten thousand dollars by draft on the said Company in the city of New York, as soon as this contract shall be ratified by the Legislature of the State.

Second. Ten thousand dollars at the expiration of one year from this same date; and 10,000 dollars each year thereafter until the completion of the said canal; the above sums to be paid to the State in the city of Leon, or in the city of New York, as the State may elect. Also the said Company makes a free donation to the said State of 200,000 dollars of stock in the enterprise, which shall be delivered to the State as soon as the certificates of stock shall be distributed by the Company.

VI. Said State shall receive for its proportion of the income of said canal, after the same shall be put in use, the following interests, namely: for the first 20 years, 20 per cent. annually out of the net profits, after deducting therefrom the interest of the capital employed in its construction at the rate of 7 per cent. per annum, and 25 per cent. each year thereafter out of said net profits, after deducting the said 7 per cent., until the expiration of the full period of the term hereinabove granted. And the State shall also receive 10 per cent. out of the net profits, without any deduction of interest, of any route which the Company may establish between the two oceans, whether it be by railroad, or carriage-road, or by any other means of communication, during the 12 years herein granted for the construction of said canal.

VII. The said Company shall be bound to make and present an annual report and account to the Government of Nicaragua, setting forth the receipts and expenditures, as well as a statement of the condition of the works of the canal; which report shall be certified by the proper officers of the Company. The State, however, shall have the right, through any Commissioners which it may appoint for that purpose, to inspect and examine at any time the books of the Company, to satisfy itself of the correctness of the said receipts and expenditures.

VIII. It is hereby stipulated that the State of Nicaragua shall have the privilege of taking stock in the said canal, to the amount of 500,000 dollars, within 1 year from the date of the ratification of this contract, which it may distribute, as it may deem proper, among any of its native citizens, or the citizens of the adjoining States, upon giving notice to the Company of such intention through The United States' Consul in the city of Leon.

IX. It is further stipulated that a majority of the stock of said canal shall always be owned by citizens of The United States; in evidence of which the stock-books of said Company shall always be open to inspection at the principal office of the Company, wherever the same may be located.

X. The Company binds itself to commence the preliminary surveys for said works within the period of 12 months from the date of the ratification of this contract, and also to complete the said canal within 12 years from the same date. But if any fortuitous or unforeseen events, beyond the control of the Company,—as for example, earthquakes, epidemics, wars, or any other events of this nature,—should appear during the progress of the work to suspend its execution, the time thus lost

shall not be reckoned as a part of the stipulated time above given for its completion. In case such event should occur, the Company shall give immediate notice to the Government of the same, for the purpose of deciding, in connection with the Company, upon the nature of such event.

XI. If none of the events which are expressed in the preceding Article should occur, and the work shall not be completed within the said period of 12 years, then, whatever may have been done by the Company to that time in the prosecution of the work, shall be forfeited to, and become the property of, the State without any indemnity.

XII. The State gives to the said Company the right to take, free of any charge or indemnity, any of the public lands or forests within the State, all the wood, stone, lime, timber, or any other materials which it may require for the construction and use of said canal and its dependencies. And the said State hereby further gives to the Company the right to take and make use of such portions of the public lands as it may require for the establishment or erection of houses, stores, docks, wharfs, stations, and all other useful objects connected with the works of said canal.

XIII. In case the Company shall require any materials, such as wood, lime, stone, &c., which may be found in or upon the lands of particular individuals, it shall be obligated to pay for the same at such price as may be agreed upon between the Company and such individuals. But all the lands which may be required for the passage of the canal in its entire route, shall be at the expense of the State, and the Company shall not be liable to pay any indemnity for the same.

XIV. All the articles that the Company may require, both for the surveys and explorations, and for the construction and use of the works of the canal, such as machines, instruments, tools, &c., and all other necessary materials, shall be admitted into the State free of duties of all kinds, and may be discharged in any of its harbours, or at any other point within its territory that the Company may select; in this last case, however, giving notice of such intention to the proper Government officer. But the Company shall have no right to introduce within the territory of the State any goods, merchandize, or any other articles of commerce for sale or exchange without paying the duties established by law. And they are also prohibited from importing any articles or materials, which may be monopolised or prohibited by the State, for any purpose, except for the use of the works of the canal.

XV. The State binds itself to facilitate and aid in every possible way the engineers, contractors, employés, and labourers who may be employed in the explorations and surveys of the route, and in the construction of the works of the canal; and to this end stipulates that all citizens of the country who may be so employed by the Company, shall be free and exempt from all civil or military service of the State whatsoever; but to entitle them, however, to the right of exemption from such military service, they shall have been previously in the employ of the Company, for at least the period of 1 month. The State also guarantees to all foreigners who may be employed on the works of the canal the same rights, liberties, and privileges as are enjoyed by inhabitants of the country; and also that they shall not be molested or disturbed in their labours while thus employed, by any internal commotions or disorders of the country; and at the same time that they shall be free and exempt from all taxes, duties, or direct contributions whatsoever during the time they may be in the Company's employ.

XVI. The said Company agrees to receive from the State as labourers upon the works of the canal any convicts who may be capable of labour,

upon such terms as may be agreed upon between the Company and the State.

XVII. The said Company agrees to transport across the said canal all passengers, goods, merchandize, and materials of every description which may be intrusted to it; and also stipulates that the canal shall be open to the transit of vessels of all nations, subject to fixed and uniform rates of tolls that may be established by the Company.

XVIII. The Company shall establish a tariff of fees or tolls for the transportation of all passengers, goods, wares, merchandize, and property of every description, and for vessels of all kinds passing through or along the said canal, which shall have the force of law from the moment in which it shall be communicated to the Government of Nicaragua, which shall be obliged to sanction the same within 8 days after its reception; and at the same time, with a view to induce the largest and most extended business by this route, the said Company agree to fix the said tariff of fees or tolls for the same, at the lowest possible rate consistent with the mutual interests, both of the State and the Company; and in case that the Company should determine at any time to alter such tariff, it shall be incumbent upon it to give 6 months' previous notice of such determination in the State paper of Nicaragua and in the principal seaport towns of The United States.

XIX. The rate of tolls and charges for the transit of the products and manufactures of the State of Nicaragua and the adjoining States shall be regulated by a particular and more favourable tariff, which shall be agreed upon between the State and the Company.

XX. The State grants to all steamers and vessels of the Company during the continuance of this contract, the right of ingress and egress to, from, and through all its harbours, rivers, and waters both on the Pacific and Atlantic Oceans, and the interior, and the use of the same free of all duties or charges of any kind whatsoever, as, for example, anchorage, tonnage, &c.

XXI. The State hereby stipulates that all vessels and steamers of the Company, and also all goods, merchandize, manufactured articles, or any other property which may be conveyed therein passing through the said canal from one sea to the other in either direction to any foreign country, shall be free and exempt from all kinds of Government duties or taxes whatsoever, and shall also be secure and protected from all interruption or detention in their course on the part of the State.

XXII. The Company shall furnish to the State annually a list of all its vessels employed in the navigation of the route, containing the names and descriptions of each of such vessels, which shall be registered in the archives of the State, and thereupon the State shall give to the Company a separate certificate of the register of each one of the said vessels, signed by the proper officer of the Government, which certificate shall serve always as a passport for said vessels through all the harbors of the State, upon presenting the same to the custom-house or harbour officer.

XXIII. The exclusive right which the Company has acquired by this contract of navigating the said lakes, rivers, and waters of the said State by means of steam vessels, from one sea to the other, is understood as not to exclude the natives of the country from free interior navigation by means of sailing, or any other vessels, excepting steam-vessels.

XXIV. The Company binds itself to transport by the said canal, on board of any of its vessels, all the principal officers of the Government and its subalterns, in case of Government necessity, from one point of

said route to any other one at which said vessels may stop, without any charge to the State therefor.

XXV. The Company is to convey by any of its steamers or vessels, free of cost or charge over the route of the said canal, all the official correspondence of the State, in consideration of which the State agrees not to collect or recover any postage or duties of any kind upon any of the correspondence of the said Company.

XXVI. The Company binds itself to construct, at its own expense, bridges upon that part of the canal that may be made between the lakes and the Pacific, upon such principal highways as may be agreed upon between the State and the Company. The said State, with the consent of the Company, shall establish rates of toll or charges upon such persons or things as may pass over said bridges, the profits from which shall be appropriated to redeem the capital invested in their construction, and the interest thereon, at the rate of 7 per cent. per annum; and when such capital and interest shall have been reimbursed to the Company, then the profits shall be divided epually between the State and the Company for the remaining period of this contract, but such bridges shall continue under the control and management of said Company.

XXVII. The State of Nicaragua, with the object of facilitating the colonization of the lands contiguous to the River St. John, and the adjacent rivers, and of the canal which in or along it may be constructed, makes a free donation to the Company of 8 stations or sections of land to be located at such points upon either one or both of the banks of the said river or canal as the Company may elect, each one of which stations shall be of 6 English miles in length, fronting upon the river or canal, and 6 miles in width, measured from the bank of the canal or river towards the interior. And the State further grants to the Company the right of alienating the lands which compose said sections to settlers, or any other person or persons who may wish to locate themselves upon the same. Said sections of land are granted upon the following conditions:

1. They shall be located by the Company in such a manner that they shall be at least 3 English miles distant from each other.

2. That no one of them shall be located within the distance of 4½ English miles from the mouth of the St. John's river.

3. The State reserves to itself the right to such points as shall be necessary for its military fortifications and public buildings.

4. That the lands granted shall not be alienated to settlers until 6 months after the commencement of the survey of the route of the said canal.

5. The State reserves to itself the supreme dominion and sovereignty over said lands and their inhabitants.

6. That said lands shall not be alienated by the Company to any Government whatsoever.

XXVIII. The colonies which the Company may establish upon said lands shall be colonies of Nicaragua, and thereupon the settlers shall be subject to the laws of the State the same as the natives of the country, being, however, exempt for the term of 10 years from all taxes and direct contributions, and from all public service, as soon as each colony shall contain at least 50 settlers.

XXIX. The State further agrees that in case any event may hereafter occur, as named in the preceding Article X, to suspend or prevent the construction of the canal, or if the said contract shall become forfeited, or annulled by either or both of the parties, and also in case the said

contract shall continue in force for the full period of 85 years, mentioned in the preceding Article IV, the said State shall always acknowledge as private property the lands which may have been alienated or ceded by the Company to settlers or other persons in virtue of the legal title which the Company has acquired by this contract to the said lands.

XXX. The Company shall have the exclusive right to construct rail or carriage roads, and bridges, and to establish steam-boats and steam-vessels on the said rivers and lakes as necessary accessories to and in furtherance of the execution of the canal; but the Company hereby stipulates and agrees that in case the construction and completion of the said canal or any part of it becomes impossible by any unforseen event or insurmountable obstacle of nature, to construct a railroad or rail and carriage road, and water communication between the two oceans, provided the same may be practicable, within the same period as is stipulated for the building of the said canal, and subject to the same terms, conditions, regulations, and restrictions, as far as they can be made applicable to the same.

XXXI. The State hereby binds itself not to sell or dispose of any of its public lands located upon or near the River St. John's, or upon or near any of the routes or points designated in Article 1 of this contract, until after the surveys shall have been made, and the route determined of the said canal.

XXXII. The State also binds itself to protect and defend the Company in the full enjoyment of the rights and privileges granted in this contract, and also binds itself not to contract with, or cede to, any Government, individual, or companies whatsoever the right of constructing a ship-canal, railroad, or any other communication across its territory between the two oceans, or the right of navigating by means of steam-vessels any of its rivers or lakes which may be occupied by this Company while this contract continues in force. But, should this contract become forfeited or annulled, then the State shall be privileged and free to contract with any other individuals or companies as it may deem proper.

XXXIII. In case any dispute or controversy shall arise, during the existence of this contract, between the State and the Company, the same shall be determined by a reference to 5 Commissioners, to be chosen in the following manner, viz., 2 to be named on the part of the State, 2 named by the Company, and the fifth to be selected by the 4 thus appointed, who shall hear and determine the matters in controversy, and decide upon the same; which decision of the said Commissioners shall be final and without appeal, and binding upon both the State and the Company.

XXXIV. It is further provided, that in the event of the 4 Commissioners thus chosen not being able to agree upon the selection of the fifth, the State and the Company shall then choose 3 individuals, out of which number they shall select one to act as such fifth Commissioner; but should they disagree in such selection, then the choice shall be made out of said number by lot.

XXXV. After the period of the 85 years herein granted to the Company shall have expired, the Company shall surrender to the State the canal or roads, and its dependencies, revenues, and privileges, free from all indemnity, for the capital which may have been invested in the said work. But it is nevertheless stipulated that the Company shall receive 15 per cent. annually out of the net profits of the canal for the period of 10 years after such surrender, provided the cost of the same shall be less than 20,000,000 of dollars; but should the cost be 20,000,000 of dol-

lars or more, then the Company shall receive said 15 per cent. for the period of 20 years after such surrender.

XXXVI. It is expressly stipulated on the part of the State of Nicaragua that the vessels, products, manufactures, and citizens of all nations shall be permitted to pass upon the proposed canal through the territory of the State, subject to no other or higher duties, charges, or taxes than shall be imposed upon those of The United States; provided always, that such nations shall first enter into such Treaty stipulations and guarantees respecting said canal as may hereafter be entered into between the State of Nicaragua and The United States.

XXXVII. It is finally stipulated that this contract, and the rights and privileges which it confers, shall be held inalienable by the individuals composing the Company herein named and their associates; and that it shall never, in whole or part, be transferred or assigned to any other Company, nor in any way become dependent upon or connected with any other Company, whatever may be the objects of the same.

XXXVIII. The present contract shall be ratified by the Legislature of the State in the shortest possible period; and on the part of David L. White shall be ratified immediately after, as agent of the Company which he represents, in virtue of the powers conferred on him to this effect.

In testimony of which we, the respective Commissioners, have signed and sealed the present contract in triplicate, in the city of Leon, in the State of Nicaragua, the 27th day of August, in the year of our Lord 1849.

(L.S.) HERMEND. ZEPEDA.
(L.S.) GREGORIO JUARES.
(L.S.) DAVID L. WHITE.

15.—*Mr. Crampton to Lord Palmerston.*

WASHINGTON, *September* 15, 1849. (Received October 3.)

MY LORD: Mr. Clayton having requested me to call upon him at the Department of State, said that he wished to converse with me frankly and confidentially upon the subject of the proposed passage across the isthmus, by way of Nicaragua and the River San Juan, with regard to which he had long felt a great deal of anxiety—an anxiety lately very much increased by intelligence he has received from Mr. Elijah Hise, who has arrived at Washington from Guatemala, where he has been for some years chargé d'affaires of the United States.

Mr. Hise has, it appears, upon his own responsibility, and without instructions either from the late or from the present administration, signed, on the part of the United States, a treaty with the state of Nicaragua, by which the latter grants to the United States an exclusive right of way across her territories, including therein the River San Juan, for the purpose of joining the two oceans by a canal across the isthmus. The treaty contains a number of provisions, such as stipulations for the construction of forts and military works upon the banks of the San Juan for the protection of the proposed passage. These Mr. Clayton enumerated to me; but he read to me, at length, the article which he regards as the most objectionable in the treaty, by which it is stipulated that the United States guarantees to Nicaragua forever the whole of her territory, and promises to become a party to every defensive war in

which that state may hereafter be engaged for the protection of that territory.

To the whole of this treaty, as well as to the "absurd stipulation" which he had just read, Mr. Clayton said that it was scarcely necessary to remark that he was entirely opposed. His views and wishes with respect to the construction of a canal across the isthmus by way of Nicaragua were, he observed, known to me, and had been, as I was aware, communicated by his direction to Her Majesty's Government; these would, he trusted have convinced your lordship that the Government of the United States have no views of exclusive advantage to themselves in this matter. He felt most anxious that the signature of the present treaty by Mr. Hise should not produce a contrary impression in any quarter; and with this view he proceeded to read to me a portion of the instructions which have been given to Mr. Squier, who has been lately sent as United States chargé d'affaires to Nicaragua. By these Mr. Squier is directed not only not to negotiate any treaty with that government on the subject of a passage across the isthmus, but not to give his support or countenance to any contract entered into by private citizens of the United States with Nicaragua on that subject, of an exclusive nature, or such as might bring the United States into collision with any other power.

The signature of the present treaty has, Mr. Clayton remarked, placed the Government of the United States in a most embarrassing situation. You know, he said, that the government have no majority in the Senate; you know that the treaty will be called for by Congress; the substance of it, indeed, has already found its way into the newspapers; you are aware of the opinion which, whether right or wrong, is generally entertained in this country of the claim of the Mosquito chief to any part of the territory claimed by Nicaragua; and you can form an idea of eagerness with which the party opposed to the government will avail themselves of the opportunity of either forcing us into collision with Great Britain on this subject, or of making it appear that we have abandoned, through pusillanimity, great and splendid advantages fairly secured to the country by treaty. It will require great caution on both sides, said Mr. Clayton, to prevent the two governments being brought into collision on account of this intrinsically worthless country.

Mr. Clayton concluded by saying that he would immediately send for Mr. Abbott Lawrence, who is now at Boston preparing for his departure for England on the 26th instant, and that he would put him into full possession of the views of the United States Government with regard to this subject. He begged me in the meantime to communicate the substance of what he had said to me to your lordship.

I have, &c.,

JOHN F. CRAMPTON.

Viscount PALMERSTON, G. C. B.

16.—*Mr. Crampton to Lord Palmerston.*

[Extract.]

WASHINGTON, *October* 1, 1849. (Received October 13.)

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Mr. Clayton, nevertheless, yesterday took an opportunity of entering upon the subject with me, with greater earnestness and at greater

length than on any previous occasion; and I am the more anxious to report accurately to your lordship the substance of his remarks, from the circumstance that the President, who happened to come into Mr. Clayton's room upon other business, on being informed of the subject on which we were engaged, waived all ceremony and joined in our conversation with great frankness, and every appearance of a wish to make proof of the most friendly feelings towards Her Majesty's Government, by evincing a disposition to deal with entire openness with regard to the affair in question.

The junction of the two oceans by a canal, Mr. Clayton observed, was an object so important to the whole of the commercial world, that it was matter for surprise that an attempt had not long since been made to effect it. The increase of population on the western coast of this continent had, however, now rendered it certain that such an attempt would ere long be made. The Government of the United States are strongly in favor of such an undertaking; but they are as earnestly opposed to its execution being made a subject for jealousy, by an attempt on the part of any one nation to monopolize to itself either the credit due to such an enterprise, or the advantages to be derived from it when effected. It should, in their view, be rather made a bond of peace and good understanding, by being brought about by a combined effort, and for the general benefit of mankind.

That great applause in certain quarters, and a certain sort of popularity, might be gained by the government of either of the countries by an attempt to effect this work upon a principle of exclusive advantage, Mr. Clayton observed, there could be no doubt. But the United States Executive disclaimed any such wish, but desired, on the other hand, not to be driven to adopt any measure for obtaining such exclusive advantage. Such popularity or applause would, in their opinion, be dearly bought by the jealousies and misunderstandings between nations which would be the inevitable result; and this it was the study of the United States Government to avert.

The two countries, Mr. Clayton continued, most deeply interested in this work are, there can be no doubt, Great Britain and the United States. Their interest in it, indeed, seemed to him to be identical. Their entire agreement with regard to it was therefore an object of paramount importance.

It was with this feeling, he said, that the United States Government would entirely disapprove of the treaty signed by Mr. Hise with the State of Nicaragua, unless they were driven to adopt it to counteract the exclusive claim of some other country. That treaty both secured exclusive advantage to the United States with regard to the proposed canal which they did not wish, under any circumstances, to possess, and threatened, besides, to bring them into collision with Her Majesty's Government upon the Mosquito question pending between them and the State of Nicaragua.

What the United States Government would now propose, therefore, was this: That the United States should abandon the treaty signed by Mr. Hise; and, instead of ratifying it, should propose, simultaneously with Her Majesty's Government, another treaty to Nicaragua, by which no exclusive advantage should be conferred on any party, and the great object of which should be to guarantee the safety of a company of capitalists, to whom a charter should be granted by Nicaragua on reasonable terms for the execution and maintenance of the work. This company Mr. Clayton would have formed upon no exclusive principle as regards the shareholders, while it should be regulated as regards the

rate of toll to be levied, and on such other points as might appear necessary, by the governments guaranteeing its safety and undisturbed possession. The Government of Nicaragua would of course have no power to levy any other dues than custom duties on articles imported for her own consumption; the transit from ocean to ocean being left free. The sole fact of the existence of such treaties between Great Britain and Nicaragua, and between Nicaragua and the United States, would, in Mr. Clayton's opinion, be quite sufficient to insure the undisturbed execution of the work; but he would propose that every other power which should conclude a similar treaty with Nicaragua, and offer a similar guarantee, should be admitted on equal terms to all the advantages of the canal. It would be by such an arrangement that the character which it ought to possess would be conferred on this great undertaking.

These considerations, if fairly laid before Her Majesty's Government, would, the United States Government are persuaded, induce Her Majesty's Government to consent to make such an arrangement with regard to the Mosquito claim as would prevent its being an obstacle to the design in question. The Mosquito claim, if disconnected with the question of a passage across the Isthmus, is not, the United States Government apprehends, one to which any great importance can be attached by Her Majesty's Government; and they cannot perceive that if the object which they think it probable that Her Majesty's Government, in common with themselves, have in view, of preventing an injurious monopoly being established by any one nation in the quarter in question, is obtained, there can be any real difficulty in arranging the question as far as the Mosquito nation is involved in it.

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Mr. Clayton then recurred to the embarrassing situation in which the friends of this great enterprise would be placed should Her Majesty's Government continue to oppose the Mosquito claim to the arrangement now proposed. The existence of the treaty signed by Mr. Hise, and the privileges conferred by it on it, by the United States, are, he said, no secrets in this country. The universal feeling would be for its adoption; and a reason for clamoring for its instant ratification would be, that this might defeat what would be represented and believed to be a plan on the part of Great Britain to secure for herself a monopoly of the most eligible passage between the two oceans. The Executive Government of the United States would be without excuse for withholding the treaty from the consideration of the Senate; and it is impossible to doubt, under the influence of the public excitement, which there is already an evident design to rouse with regard to this question, what would be the result. On the other hand, were the administration enabled to submit to Congress an arrangement such as is now proposed, and in which Her Majesty's Government would be in friendly concurrence with the United States Government for this great work, every pretext would be taken away from the most unreasonable, and every chance of future misunderstanding between the two governments avoided. Mr. Clayton considered that this question could never be settled amicably unless both Great Britain and the United States withdrew all claim to the territory of Nicaragua and Costa Rica. If either of the two governments held possession of the country on either side of the canal, it would hold an inadmissible advantage over the other; in a word, said he, let us both abandon all claim to what is called Nicaragua and Costa Rica, and lend the countenance of both governments to the construction of a ship-canal, if it be found to be practicable; if you refuse this offer, we are driven in self-defense to adopt the treaty.

In the whole of these observations General Taylor cordially concurred; the attempts, he remarked, which were making and would be made in many quarters to produce a misunderstanding or a collision between the two governments on this matter were, in his opinion, only to be met by perfect frankness and fair dealing; it was his earnest wish, therefore, that the matter should be laid in this spirit before your lordship, and he expressed an anxious wish that the question might be promptly arranged equally to the honor and advantage of both countries.

JOHN F. CRAMPTON.

Viscount PALMERSTON, *G. C. B.*

17.—*Mr. Crampton to Lord Palmerston.*

WASHINGTON, *November* 4, 1849.—(Received November 19.)

MY LORD: I had the honor of forwarding to your lordship, with my dispatch of the 15th ultimo, the copy of a contract between an American company and the Government of Nicaragua for the formation of an interoceanic canal by way of the River St. John and the Lakes of Nicaragua, which contract was drawn up under the supervision of Mr. Squier, in accordance with the provisions of the treaty which he was engaged in negotiating with the Nicaraguan Government; and I stated that Mr. Clayton, although he approved of the general tenor of the contract, thought that some of the articles were objectionable from being of an exclusive character, particularly those which require that all directors of the company and a majority of the shareholders shall be American citizens.

Mr. Clayton now informs me that he has had a conference with the two principal directors of the company in question; and that, as he anticipated, he finds that no objection will be raised on their part so to modify the provisions of the contract as to remove from it anything of an exclusive nature.

These gentlemen, Mr. Clayton remarked, far from wishing to adopt any regulations which might have the effect of deterring British capitalists from embarking in this great undertaking, are most anxious to secure their co-operation; for the American capitalists are sensible that without such co-operation there would be but small prospect of the ultimate success of the enterprise.

I have, &c.,

JOHN F. CRAMPTON.

Viscount PALMERSTON, G. C. B.

18.—*Mr. Abbott Lawrence to Lord Palmerston.*

UNITED STATES LEGATION,
November 8, 1849.—(Received November 8.)

MY DEAR LORD: As I told you in our conversation this morning, I have been instructed by the President to inquire whether the British Government intends to occupy or colonize Nicaragua, Costa Rica, the Mosquito Coast, so called, or any part of Central America. I have also been instructed to inquire whether the British Government will unite with the United States in guaranteeing the neutrality of a ship-canal,

railway, or other communication to be open to the world, and common to all nations. May I beg the favor of an answer to these inquiries, and to express the wish that I may receive it before two o'clock to-morrow, so as to send it out by this week's packet?

I am aware that Nicaragua is in dispute with Costa Rica, on the one hand, about her boundary, and with the Mosquitos, on the other, about their sovereignty. I have no purpose now to enter upon those questions; I only desire to know the views of Her Majesty's Government on the questions I have proposed. At the same time, I cannot but think that Great Britain and the United States can heal these breaches by kind offices; and that the Indians can be provided for in a manner satisfactory to Nicaragua and Great Britain, and far better for them than the equivocal position they now occupy.

I need not assure your lordship that the United States have no ulterior purposes in view. They frankly disclaim all intention of obtaining territory in Central America; and I have no doubt would be willing to mutually agree with Great Britain neither to settle, annex, colonize, or fortify that country.

I have, &c.,

ABBOTT LAWRENCE.

Viscount PALMERSTON, G. C. B.

19.—*Sir Henry Bulwer to Lord Palmerston.*

[Extract.]

WASHINGTON, *January* 6, 1850. (Received January 22.)

Since arriving in this country I have taken some pains to ascertain in what way the questions that have arisen between Her Majesty's Government and that of the United States, with respect to Nicaragua and the kingdom of Mosquito, might be brought to a prompt and satisfactory conclusion. Your lordship is aware that the main interest of the United States in this matter has arisen from its newly acquired possessions in the Pacific, and the project of an American company to form a water communication between the two oceans, passing through the Lake of Nicaragua and the river San Juan; this company having obtained from the state of Nicaragua the use of its lakes and territory for this purpose, and the use also of the river San Juan, to which Nicaragua lays claim.

In this manner the Government of the United States became interested in the pretension of the Nicaraguans, and desires to establish the fact that the river San Juan, ceded by the Nicaraguans to an American company for an object of the utmost interest to America, should be placed at the disposal of the state making that concession. This first interest in the claims of Nicaragua, therefore, proceeds from an interest in the construction of the canal to which I have been alluding.

But it so happens that, while it is very difficult, not to say impossible, for Her Majesty's Government to listen to those claims of Nicaragua, our decision with respect to which has been already openly taken, there is no difficulty, I believe, whatsoever in Her Majesty's Government assisting the United States Government in its general views with respect to that water communication across Central America, which Great Britain must be almost as desirous as the United States to see established. Our great object, therefore, as it has appeared to me, is to dis-

place the discussion from the claims of Nicaragua and Mosquito, on which it is unlikely that the two Governments of Great Britain and the United States should agree, and bring it to the consideration of the canal, on which it is almost certain that their views will be identical.

Having conversed with several persons of importance, and of different parties on this subject, and with Mr. Clayton himself, I am disposed to think that the best means of doing this is by a convention between Great Britain and the United States, having for its object to facilitate the construction of the desired passage between the Atlantic and the Pacific, upon such terms as, without entering upon the question of the rival claims of Nicaragua and the Mosquitos, would confer upon American commerce all it can desire to obtain in a manner corresponding with the dignity and honor of Great Britain, and the disinterestedness of her protectorate over the Mosquito territory.

H. L. BULWER.

Viscount PALMERSTON, G. C. B.

20.—*Sir H. Bulwer to Lord Palmerston.*

[Extract.]

No. 19.] WASHINGTON, *February* 3, 1850. (Received February 18.)

I should hardly have acted, however, in any formal manner on this consideration alone, but having heard of the very serious illness of Mr. Lawrence, and been informed by Mr. Clayton that if this gentleman recover he will not be able to transact public business for a considerable time, I deemed that I stood in one of those positions in which it is necessary for a public agent to take upon himself a certain degree of responsibility for the sake of the public service; and, consequently, when Mr. Clayton, after informing me of Mr. Lawrence's severe indisposition, and explaining to me the very critical position in which he himself stood, added that he must either deliver up the whole subject to popular discussion and determination, or come to some immediate settlement upon it, I entered with him into a full consideration of the affair, and finally agreed to submit to your lordship's sanction the inclosed project of convention.

In order to make clear the spirit and intention with which the said project is drawn up, I feel it necessary to enter with your lordship into some statement of my own views with respect to the questions out of which it arises, some statement of the causes which have raised these questions into importance, and some explanation of the nature of the solution which I have given to such questions.

It seemed then to me that Her Majesty's Government, after asserting, first by argument, and finally by force, the rights of the King of Mosquito over a particular territory, and driving therefrom the agents of the feeble Government of Nicaragua, could not, at the demand of another power of greater strength, restore to the Nicaraguans that territory from which they had been ejected.

Nevertheless, I was aware that the course which Her Majesty's Government pursued in this case was with a view to the general interests of commerce as well as to those of justice; and that so far from wishing to make the protectorate which Her Majesty exercises over the Mosquito territory, or that territory itself, subservient to the views of any small, selfish, or grasping policy, it would be your lordship's desire to make

both the one and the other useful, in the widest sense of the term, to the common advantage of mankind and the universal purposes of traffic and civilization.

Such being my conviction and knowledge on the one side, I was equally certain, on the other, that the interests of the United States were only incidentally involved in the question between Nicaragua and the Mosquitos, and mainly referred to another subject, which, though connected with the disputes which have arisen as to the extent of the Nicaraguan territory, admit of a separate adjustment.

The construction of any rail or water communication across that portion of Central America which separates, by a comparatively small distance of land, the two oceans of the Atlantic and Pacific would always have been of great interest to the United States; but since the possession of California and Oregon this interest has indefinitely increased, so that that which was once a question of convenience is now almost a matter of necessity. Thus the various routes by which a railway or canal could open a way between the two seas have, latterly, been under the constant attention of this government; and amongst the most feasible and important of the schemes indicated has been one of a canal, from the port of Realejo, through the Lakes of Nicaragua, to the mouth of the river San Juan.

Now, the state of Nicaragua made to an American company formed for the construction of such a canal, the grant, accompanied by various favors and privileges, of all such portion of the territory claimed by it, as the said company required; and, in the two treaties to which I have already referred, namely, those of Mr. Hise and Mr. Squier, the object of the American agents has evidently been to strengthen the contract which the above-mentioned company had made.

It was, however, impossible for the contemplated scheme to be executed under any grant from the state of Nicaragua as long as the mouth of the San Juan River was in the hands of another people or kingdom, protected by Great Britain; and, moreover, it was generally supposed that the Government of Great Britain had placed the Mosquitos in possession of Greytown, expressly in order to get hold of this entrance to the canal passage for itself, and, at all events, to prevent its falling into the possession or being subservient to the views of any other power.

On these grounds has arisen all the excitement here touching the British protectorate of Mosquito, and in this manner the United States has become interested in the dispute between the Nicaraguans and ourselves.

It is indeed most certainly true that if the American company, having the grant of which I have spoken from Nicaragua, had been disposed to carry it out in its original terms, and that if the United States Government had been prepared to accept the exact terms of the treaties made with Nicaragua by their agents it would have been impossible for Great Britain to favor an undertaking which expressly established a monopoly of trade for American citizens through the most important passage (if such a canal as that contemplated can be executed) that the commerce of the world can enjoy; and I cannot consider it unfortunate for the general interest that Her Majesty's Government should have been in a position to make its consent necessary to a work of such universal importance.

But both the American company to which I have alluded and the American Government have latterly manifested an earnest desire to have it clearly understood that they will modify all that portion of their original engagements with Nicaragua which secures any advantages to one state which another may not equally enjoy; and if such be the spirit

which is to preside over the vast project under consideration Great Britain has not only no interest in preventing its success, but every interest in forwarding its completion and providing for its security.

In this view of the case, the protectorate which Her Majesty exercises over the Mosquitos, instead of being prejudicial to the aforesaid enterprise, may be an essential element in its favor, and all that seemed to be required in order to bring Great Britain and the United States to a perfect understanding is, that both should abandon every particular advantage, the one such as might be derived from the protectorate over the Mosquitos, and the other such as might be derived from any contract or treaty with Nicaragua; and to make the fact that they do so clear and palpable, taking as the basis of their thorough good understanding the construction of that canal which offers benefits common to the two, and dropping as a point of controversy those disputes as to the Nicaragua and Mosquito territory, on which it is next to impossible that they should come to any agreement.

It is with such views that the inclosed convention has been drawn up, its object being to exclude all question of the disputes between Nicaragua and the Mosquitos, but to settle, in fact, all that it was essential to settle with regard to those disputes as far as the ship communication between the Atlantic and the Pacific and the navigation of the River San Juan were concerned.

There are indeed stipulations which extend farther than the mere engagement, on our part, to use our best endeavors to obtain the free transit of this river, inasmuch as that we also in the said convention agree, as do the United States, not to occupy or colonize either Nicaragua, Costa Rica, the Mosquito Coast, or any part of Central America; but in consenting to these provisions, I know that I merely carry out the views and opinions of Her Majesty's Government, which have been already expressed on this subject, though in a less formal manner.

I do not pretend to say that the project of convention thus submitted to your lordship's consideration is such, either in its precise terms, arrangements, or enactments, as I should have myself proposed, or, if there had been more time for alteration and discussion, adopted. But it settles the main question immediately at issue, and also establishes a general basis for a common policy and perfect good understanding between ourselves and the United States in that portion of the world which has latterly been the scene of constant suspicions and angry rivalries on the part of our agents, and is, moreover, the record of great and noble views entertained and expressed by two great and kindred nations on one of the works most likely to commemorate our epoch, and to be of the utmost interest and importance to commerce and civilization.

For these reasons, I confess that I send it to your lordship, with the humble confidence that it will, as a whole, meet with your approval.

At all events, I know that it is an arrangement which Mr. Lawrence could hardly have made in England, and that I myself could not have made here except after much preparation and under favorable circumstances.

I may add that it will probably be attacked with violence by the parties who are for supporting Mr. Monroe's famous doctrine at all hazards, and who contend that Mr. Hise's convention is the only one that this country ought to adopt or sanction; but, on the other hand, I think I can promise that it will be duly esteemed and approved of by the Senate, and carry with it the weighty sanction of all reasonable men.

H. L. BULWER.

Viscount PALMERSTON, G. C. B.

[Inclosure.]

Project of Convention respecting the Isthmus Canal.

The United States of America and Her Britannic Majesty being desirous of consolidating the relations of amity which so happily subsist between them, by setting forth and fixing in a Convention their views and intentions with reference to any means of communication by ship-canal which may be constructed between the Atlantic and Pacific Oceans, by the way of the River San Juan de Nicaragua, and either or both of the Lakes of Nicaragua or Managua, to any port or place on the Pacific Ocean, the President of The United States has conferred full powers on John M. Clayton, Secretary of State of The United States, and Her Britannic Majesty on the Right Hon. Sir Henry Lytton Bulwer, Envoy Extraordinary and Minister Plenipotentiary of Her Britannic Majesty to The United States, for the aforesaid purpose; and the said Plenipotentiaries having exchanged their full powers, which were found to be in proper form, have agreed to the following articles:

ART. I. The Governments of Great Britain and The United States hereby declare that neither the one nor the other will ever obtain or maintain for itself any exclusive control over the said ship-canal, agreeing that neither will ever erect or maintain any fortifications commanding the same, or in the vicinity thereof, or occupy or colonize either Nicaragua, Costa Rica, the Mosquito Coast, or any part of Central America; nor will Great Britain or The United States assume or exercise any dominion over the same, or take advantage of any intimacy, or use any alliance, connection, or influence that either may possess with any State or people through or by whose territory the said canal may pass, for the purpose of acquiring or holding, directly or indirectly, for the subjects or citizens of the one, any rights or advantages in regard to the commerce or navigation through the said canal, which shall not be offered on the same terms to the subjects or citizens of the other.

II. Vessels of Great Britain or The United States traversing the said canal shall, in case of war between the contracting parties, be exempted from detention or capture by either of the belligerents, and this provision shall extend to such a distance from the 2 ends of the said canal as it may hereafter be found expedient to establish.

III. In order to secure the construction of the said canal, the Contracting Parties engage that if any such canal shall be undertaken upon fair and equitable terms by any parties having the authority of the Local Government or Governments through whose territory the same may pass, then the persons employed in making the said canal, and their property used or to be used for that object, shall be protected, from the commencement of said canal to its completion, by the Governments of The United States and Great Britain from unjust detention, confiscation, seizure, or any violence whatever.

IV. The Contracting Parties will use whatever influence they respectively exercise with any State or States, or with any people possessing, or claiming to possess, any jurisdiction or right over the territory which the said canal shall traverse, or which shall be near the waters applicable thereto, in order to induce such States or people to facilitate its construction by every means in their power. And furthermore, Great Britain and The United States agree to use their good offices wherever or however it may be most expedient, in order to procure the establishment of 2 free ports, one at each end of the said canal.

V. The Contracting Parties further engage that when any such canal shall have been completed, they will protect it from interruption, seizure, or unjust confiscation, and that they will guarantee the neutrality thereof, so that the said canal may forever be open and free, and the capital invested therein secure. Nevertheless, the Governments of The United States and Great Britain, in according their protection to the construction of the canal which this Treaty specifies, and guaranteeing its neutrality and security when completed, always understand that this protection and guarantee are granted conditionally, and may be withdrawn by both Governments or either Government, if both Governments or either Government should deem that the persons or company undertaking or managing the same adopt or establish such regulations concerning the traffic thereupon as are contrary to the spirit and intention of this Convention; either by making unfair discriminations in favour of the commerce of one of the Contracting Parties over the commerce of the other, or by inflicting oppressive exactions and unreasonable tolls upon passengers, ships, or merchandise; neither party, however, shall withdraw the aforesaid protection and guarantee without first giving 6 months' notice to the other.

VI. The Contracting Parties in this Convention engage to invite every nation, state or people, with whom both or either have friendly intercourse, to enter into stipulations with them similar to those which they have entered into with each other, to the end that the whole world may share in the honour and advantage of having contributed to a work of such general interest and importance; and the Contracting Parties likewise agree that each shall enter into treaty stipulations with such of the Central

American nations, states, or people, as they may deem advisable for the purpose of more effectually carrying out the great design of this Convention; namely, that of constructing and maintaining the proposed ship communication between the 2 oceans for the benefit of mankind, on equal terms to all, and of protecting the same; and they also agree that the good offices of either shall be employed, when requested by the other, in aiding and assisting the negotiation of such treaty stipulations.

VII. It being desirable that no time should be unnecessarily lost in commencing the great undertaking herein contemplated, the Governments of The United States and Great Britain determine to give their support and encouragement to such persons or company as may first offer to commence the same, with the necessary capital, the consent of the local authorities, and on such principles as accord with the spirit and intention of this Convention.

VIII. The Governments of The United States and Great Britain, in entering into the present Convention, have not only desired to accomplish a particular object, but also to establish a general principle; they therefore hereby agree to take under their consideration any project for a canal or railway which may be submitted to them, and which may have for its purpose to connect the Atlantic and Pacific, or to shorten and expedite the transit of persons, ships, or merchandise between the 2 great oceans: and should either of the 2 Governments deem it to be beneficial to the general interests of commerce and civilisation to extend its support, encouragement, or protection to such railway or canal, it will forthwith invite the other of the 2 Governments to be a joint party in affording such protection, support, or encouragement; and will neither request or accept from any persons, company, or state, any advantages or privileges for its own citizens or subjects with respect to such railway or canal which shall not be open for all other Governments to obtain for their citizens or subjects upon the same terms as those which are proposed to or accepted by itself.

21.—*Lord Palmerston to Sir Henry Bulwer.*

FOREIGN OFFICE, *March* 8, 1850.

SIR: I have received your dispatch of the 3d ultimo, in which you state the reasons which had induced you to enter with the American Secretary of State into a full consideration of the questions connected with the proposed plan for establishing a communication between the Atlantic and Pacific Oceans, by a ship-canal, by way of the river San Juan de Nicaragua and the lakes of Nicaragua and Managua; and you inclose the draft of a convention on this subject which has been agreed upon between you and Mr. Clayton, subject to the approval of Her Majesty's Government.

I have to acquaint you that Her Majesty's Government entirely approve of the course which you have pursued in this important affair. You are therefore authorized to sign, on the part of Her Majesty, the convention of which the draft is inclosed in your dispatch above mentioned; and in order to enable you to do so, I transmit to you a full power, which the Queen has been pleased to grant to you under the Great Seal, constituting you her plenipotentiary for this negotiation, or for any other negotiation with the United States that may arise during your mission.

I have also to instruct you to deliver to the American plenipotentiary, at the time of the signature of the convention, a note stating that you have received the express order of your government to declare, with reference to the engagement taken by my letter to Mr. Lawrence, dated the 13th of November last, a copy of which was inclosed in my dispatch to Mr. Crampton of the same date, that the British Government has no intention to make use of the protection which Great Britain affords to the people of Mosquito, for the purpose of doing, under cover of that protection, any of the things the intention to do which is disclaimed in the letter to Mr. Lawrence above referred to.

The exchange of the ratifications of the convention may be fixed to

take place as soon as possible, either at Washington or at London, as may be deemed most convenient by you and Mr. Clayton.

After the convention shall have been signed and ratified, Her Majesty's Government will be happy to concert with the Government of the United States as to the mode and form in which the engagement contained in Article VI of the draft of convention shall be carried into effect; whether by treaties with other powers, comprising stipulations in harmony with those contained in the proposed convention between Great Britain and the United States, or by treaties of accession. If treaties of accession should be adopted, the convention should be annexed to each of such treaties, accompanied by an engagement to adopt the principles and stipulations therein recorded, so far as they may be applicable to the acceding power.

I am, &c.,

PALMERSTON.

Sir HENRY BULWER.

22.—*Decree of the director of Nicaragua of March* 9, 1850, *incorporating the American Atlantic and Pacific Ship-Canal Company.*

Whereas the American Atlantic and Pacific Ship-Canal Company should be legally accredited in the state for the exercise of its functions in such a manner as not to meet with any embarrassment in the development and prosecution of the enterprise, and as it is indispensable that the government of the state should grant it all the means which are in its power for this object: Therefore, in virtue of its faculties, the government has resolved to decree, and does decree, the following act of incorporation:

First. The state of Nicaragua hereby makes, constitutes, and appoints Cornelius Vanderbilt, Joseph L. White, Nathaniel H. Wolfe, and their associates, whomsoever the same may be, now or hereafter, a body politic and corporate with perpetual succession, by the name and description of the American Atlantic and Pacific Ship-Canal Company, for the purpose of carrying into full effect the objects and purposes of the grant and charter heretofore made and given by said state to the aforesaid parties, in such manner and by such means as to them and their successors may seem proper, and not inconsistent with said grant and charter; and for such purpose the aforesaid parties and their successors are hereby invested with all necessary power and authority as a body corporate and politic.

Second. The said body corporate may, from time to time, in any manner which to them may seem proper, pass by-laws and adopt rules and regulations for the management and government of the said body corporate and its business, fix the amount of capital stock thereof, increase and regulate the subscriptions to the same, designate the number of shares and value thereof, define the mode of issuing, and issue the same, and provide for and regulate the manner of transferring the same, by themselves or their officers, and do all other acts and things which to them may seem necessary or proper, fully to execute and carry out the purposes of the said grant and charter.

Third. The said body politic and corporate may, from time to time, as it may determine, select a board of directors, and all other officers, and appoint agents and servants for the management of all the business and affairs of said company, which said board, when elected, as the said body corporate may provide, together with the president, shall be

invested with all the powers of the said body corporate, unless by the said body the same shall be limited or defined; and the said body corporate may provide by by-laws, or otherwise, for the number of directors, the manner and time of their election, and the duration of their term of office.

Fourth. The said body corporate and politic shall adopt a common seal, and may, from time to time, alter the same, and shall have power to sue and be sued to final judgment, plead and be impleaded, complain, answer, or respond in all the judicial tribunals of this state, to the same extent as a natural person and a citizen of the state.

Fifth. The capital stock of said body corporate, and all of their property, choses in action, rights and effects, shall at all times and forever be exempt from taxation, charge, or other burden or duty whatsoever, on the part of the state.

Let it be communicated to the company by the conduct of David L. White, and to the authorities and functionaries of the state whom it may concern.

Given in Leon, the 9th day of March, in the year 1850.

NORBERTO RAMIREZ,
Supreme Director.

Mr. SEBASTIAN SALINAS,
Secretary of Foreign Relations.
SEBASTIAN SALINAS.

23.—*Mr. Lawrence to Mr. Clayton.*

[Extract.]

No. 44.] UNITED STATES LEGATION,
London, April 19, 1850.

SIR: * * * There is on the eastern coast of Central America, between Cape Honduras on the north, and the San Juan River on the south (possibly extending as far even as Boca del Toro), a tract of low, swampy, unhealthy land of a various width, and rising in its western border into highlands and mountains. The lower part of this country has never been much occupied by Europeans in consequence of its insalubrity. The mountainous parts are said to contain but little valuable mineral stores. At the time of the discovery by Columbus, and until within a comparatively recent period, it was inhabited by some fifteen or sixteen tribes of Indians, speaking different languages, and often at war with each other, and, among others, there was a tribe known as the Mosquitos (so called by the early voyagers from the abundance of *moscas* found on the coast), living between Cape Honduras and Cape Gracias à Dios. They gradually overcame and almost exterminated the more southern tribes, aided, perhaps, by the buccaneers, and by degrees the name of Mosquito came to be applied to all living north of the Bluefields, and I think in all the discussions of the last century relating to the subject, the Mosquito country was never understood to extend far, if at all, below the river. It is now defined by Lord Palmerston as reaching to the San Juan River, embracing the northern bank so as to take in San Juan de Nicaragua (anglicized into Grey Town), and command the mouth of the river. In my opinion, it is quite immaterial where the royal geographers are directed to draw the line, as I am satisfied the whole claim is without just foundation. All the good maps of the sixteenth, seventeenth, and eighteenth centuries—

French, Spanish, Dutch, and English—carry Honduras from coast to coast; Nicaragua the same, and fix the southern terminus of Mosquito shore at or near where I have indicated.

The character of the Indians at present occupying this country deserves notice, since Great Britain seeks to invest them with the attributes of an independent nation.

In the year 1836 one James Woods, a native of Ipswich, in the county of Suffolk, allured by the promises of an emigration company, set sail for Vera Pas. On his return in 1840 he published a sketch of his adventures in Central America to serve as a warning against similar companies. Among other places, he resided a while at Cape Gracios à Dios in charge of a store of provisions, rum, &c., &c. He says:

> The rum was a dangerous thing in the store, for the Indians will kill a man for the sake of a glass of rum, and there were only five Europeans on the Cape. I had a demijohn of brandy for the Indian King, but he was gone up the river. He and his brother were taken from the Mosquito shore when young and carried to the Island of Jamaica, where they were taught to read and write the English language. After staying there for several years they were brought back to the Mosquito shore. One was made king, the other a general, and although brought up in a civilized state, yet they returned to the wild and savage state in which their people live, getting drunk and giving themselves up to the most disgusting habits. No sooner had the King heard I had a demijohn of brandy for him than he set out to return home. He went to the house of a Frenchman named Bouchet, who came down to the store and told me His Majesty wished to see me. I went up to the house, where the King was lying on a bed rather unwell. I made my compliments to him, and asked how he did; he told me he was very poorly, and that he wanted me to draw him a gallon of brandy. Accordingly I went down to the store and drew him a gallon, which I carried to him. He asked me to drink, and stay and dine with him, which I did. He told me that he loved me; I replied, you love the brandy better; but I turned it off with a laugh, or he would have been offended with me. He staid for two or three days, and then left for Bluefields. These Indians far exceed all the Indians I have ever met with in lying, thieving, and everything that is disgusting. They are given up to idolatry, and lead an indolent life.

After giving details of their ignorance and barbarism, he adds: "They are also great drunkards, and are never easy but when they are drunk." And of the English settlers on the shores, he says, they "are almost as bad as the natives, and live in almost as disgusting a manner." This strong picture, painted by an Englishman, is borne out by the personal relations of many other travelers.

The historical portion of this paper will relate not to Mosquito alone, but to Central America, from Tehuantepec to Panama. The naval and military operations of the Spaniards were so extensive, their conquests were so complete, and their settlements were so rapid and numerous, that it is impossible to separate the conquest and colonization of that part of Nicaragua and Honduras called the Mosquito coast from the subjugation and settlement of that portion of them to the west of the indefinite line swaying across their interior at the will of the foreign office.

* * * * * * *

I am left, therefore, in this connection, only to show that Spain *discovered* Central America and *occupied* it. I believe that she did much more: that she discovered, circumvallated, explored, conquered, settled, retained possession of, and governed it, with only such interference as the rudeness of the times permitted, or rather could not prevent.

The principal authorities for the early history of Central America are Oviedo, Peter Martyr, Gomara, Enciso, Cortes, Las Casas, Herrera, Torquemada, Remesal, Cogolludo, Wytfleit, De Saet, Ogilby, Villagutierre, Sanson, Moll, Jefferys, Navaretto, Juarros, Linschot, Boterro, Hakluyt, Purchas, Alcedo, &c., &c. I have caused all these to be carefully

examined and compared with many other writers, Spanish, English, Dutch, and French. The following facts are derived chiefly from the above sources:

Columbus in his fourth voyage first made land on the North American continent at Cape Honduras, near the present town of Truxillo, on the 17th of August, 1502, and thence proceeding easterly, shortly afterwards entered the mouth of Black River, and in accordance with his instructions landed and took formal possession of the country, in the presence of the unresisting natives, in the name of the crown of Castile. In the early Spanish maps this river is called the Rio del Possession, a name given to it by Columbus himself in commemoration of this event. He next touched and took possession at Cape Gracios à Dios, where he remained a short time, holding friendly intercourse with the natives, whom he described more favorably than he did their country. Thence he coasted leisurely southward toward Veragua, communicating often with the inhabitants, and touching particularly at the Bluefields River, and at the mouth of the San Juan.

The results of this voyage being known in Spain, expeditions were fitted out at different times under various commanders, which reconnoitered thoroughly the entire coast from Darien to the Bay of Honduras, penetrating even to the extremity of Gulf of Dolce, and thence along the coast of Yucatan. Much intercourse was held with the natives, and every river and bay was penetrated to find the supposed strait to the land beyond the Ganges, for this country was then believed to be an island, or part of India, and the Spaniards were not fully disabused of the idea until the discovery of the Pacific by Balboa in 1512. After this event expeditions sailed from year to year along both the Atlantic and Pacific coasts, with the double purpose of discovering the supposed passage connecting the two oceans, and of exploring, conquering, and settling the country, and so rapidly were the latter objects accomplished that by the year 1530, not only the Pacific coast from Panama to the Gulf of Fonsecas had been reconnoitered, but the interior from Tehuantepec to Veragua had been crossed and recrossed; many tribes of Indians had been subjected, and towns had been built under the commands of the two d'Avilas Olid, Francis de Las Casas, Cortes, Alvarado, Gringalsa, Cordova, Roxis, Montejo, &c. From the nature of the country, as I have already described it, the principal settlements were made near the Pacific coast, but the Spaniards did not neglect to consummate their title on the eastern shore, Truxillo, Omoa, and other towns on the bay of Honduras were founded in 1524. Roxis attempted a settlement at Cape Gracios à Dios in 1530, which he found impracticable from the nature of the country. Merida was founded in 1542; Valladolid in 1526, and rebuilt in 1543; Campeche in 1540, and in the interior many towns were built (as Olancho, Comajagua, Segovia, &c. Before 1530 the greater proportion of the very numerous tribes of Indians were subjected to the Spanish authorities either by the military or the ecclesiastical power, for, after the coming of Las Casas, the missionaries did nearly as much as the soldiers in controlling the aborigines. Nicaragua and Honduras are reported to have been most densely populated at the time of the discovery; but scarcely half a century had elapsed before nearly nine-tenths of the natives had faded away before their bloody conquerors. As early as 1524, Cortes wrote to the Emperor Charles V that only two of the many tribes of Honduras remained unconquered. Shortly after these yielded to the power of Alvarado. Some fled to the mountains, and the country now known as Mosquito, where they remained unmolested, protected by their own weakness, and by the want of mineral wealth in the soil on which

they had taken refuge. They were shielded too by a still stronger arm. Spain, ever jealous of the interference of other European powers in her traffic, left the region unsettled to be a barrier between the Atlantic and the golden regions of the West. But though she neglected to cultivate she never neglected to protect and defend. Guarda costa were early established, to protect the coast, and watch over the argosies, as they set sail for the old world.

The natives of Mosquito were thenceforward constantly under the influence both of the Franciscan and Dominican orders of missionaries. From 1575 to a very late period, Spanish missionaries have almost always resided, by order of the government, among the numerous tribes of Mosquito. Sometimes as many as twenty at a time were there exerting a great influence in softening the barbarity of those savage tribes. It is true that many of them were subjected to the most revolting cruelties, and suffered death itself, yet in almost every instance these were caused by the hostilities and treacheries of these warlike tribes among themselves, and not, as the English writers assert, by their hatred of the Spanish yoke. The missionary was destroyed, not by the tribes with which he lived, but by its enemies. Fortunately the histories of the Franciscan and Dominican orders give ample details of these extraordinary missions.

I think I have now established all I promised with reference to the discovery, conquest, and settlement of this country by Spain. It is not to be conceded, however, that the exaggerated accounts of her wealth and the value of her commerce soon attracted hostile parties to these shores, who in process of time increased in power, and became the foundation for claims adverse to her territorial rights on the Mosquito coast. This brings me to a notice of the buccaneers, or pirates of the West Indies.

The early buccaneers were composed of English, French, Dutch, and Portuguese adventurers. The private enterprises of Drake and his cotemporaries are well known. Like all other buccaneer adventurers for half a century later, they were directed against the Spaniards, only because Spain was the wealthiest and most commercial nation, and therefore the best object of plunder. During time of war (and it should be borne in mind that Spain was almost constantly at war with some European power) these pirates managed to get from unscrupulous governments letters of reprisal, and sometimes sailed under English, sometimes under French, sometimes under Dutch, and sometimes under Portuguese commissions, as the case might be. Spain treated them all alike as pirates. England, in those days, so far from availing herself of their acts, disclaimed them. The Spanish ambassador at London repeatedly remonstrated against their depredations, and was always met with a disavowal. By the time of Cromwell they had become very numerous. Spain increased her guarda costa, and sought to protect herself by destroying them, but this only served to unite all shades and nations together under a kind of piratical republic of the sea. Meanwhile England, France, and Holland had each gained a footing in the West Indies. The pirates had grown so numerous that no power was exempted from their depredations. England felt their influence and was about negotiating with Spain for their overthrow, when the difficulties between Charles and his Parliament interfered to prevent. When the negotiations were renewed with Cromwell he put off the conclusion of a treaty till he could secure some conquest in the West Indies, and dispatched secretly an expedition against Cuba, which, failing in its object, won Jamaica in 1655 to English dominion. Then England of-

fered to negotiate, and define the respective rights of England and Spain, but the latter refused. Immediately after the conquest of Jamaica the governors of that island turned their attention to the pirates; and, finding their reduction too difficult a work, sought to take advantage by regulation of what they could not destroy by force. The stringent measures they took induced many to abandon their dangerous avocation, and retire to the Indians of Yucatan, Honduras, and Nicaragua, with whom they had been in intercourse for many years, and hence the great increase of the English trade in logwood, and subsequently in mahogany. The Mosquito Indians about Cape Gracias á Dios had been repeatedly stimulated by the Dutch, French, and English adventurers during the several wars against Spain, to join in the expeditions against the Spanish settlements, and indeed were on such friendly terms with all that each claims the priority of intimacy with them. The earliest attempt of the English to tamper with them was under Sir Thomas Modyford, governor of Jamaica, about 1677. His proceedings were not approved, and in 1670 he was arrested and sent to England. The illicit trade in logwood and other things from Campeche to the Bay of Honduras and the Mosquito country had become so offensive to Spain, who feared that it might cover a permanent occupation, that she was induced to enter into the treaty of 1670, which yields to England the islands she had conquered in the West Indies, defined for the first time the respective rights of the parties, and has been made the basis of all subsequent treaties. This brings me to the second position of the British Government.

By the seventh article of the treaty of Madrid "it is agreed that the most Serene King of Great Britain, his heirs and successors, shall have, hold, keep, and enjoy forever, with plenary right of sovereignty, dominion, possession, and propriety, all those lands, regions, islands, colonies, and places whatsoever being or situated in the West Indies, or any part of America, which the said King of Great Britain, or his subjects, do at present hold and possess." It is plainly of great importance to the present inquiry to determine what lands, regions, islands, colonies, or places King Charles, or his subjects, held or possessed in America on the conclusion of that treaty.

Now it is evident that this article was inserted in the treaty to determine a previous conflict of claims to sovereignty, by the fact of existing possession, and that where the claims of the parties had not come in conflict, it had no validity. Leaving out of view all the American continent to the north or south of Central America and the Indies, it is well known that the title to Jamaica was in dispute, and that this article was expressly inserted to settle it by confirming England's occupation. Had it any reference beyond that to Mosquito? After the preceding review I think I am warranted in saying it had not, because, in the first place, I am unable to find that the sovereignty had ever been in dispute; and because, in the second place, the only possession approaching a hostility to Spanish right was that of the buccaneers, composed of all nations, which was not continuous, which was piratical, and therefore clearly illegal, which was disavowed by England, and therefore cannot inure to her, and which was made in admission of Spain's title, since it was a war upon Spain.

And further, Great Britain does not now claim ever to have held or possessed Mosquito. To adopt a little of Lord Palmerston's severity of criticism on the language of treaties, I say that the terms "hold" and "possess" have definite meanings in international law, that they imply title, either temporary, as in the case of a violent occupation in time of

war, or permanent, to which occupation is not a necessary incident. The claim under which Great Britain shelters the illegal occupation of Mosquito by the English is not set up in itself, but in a monarch of its creation, who is alleged to reign under its protection.

The political relation of protector and protected is not a new one. It grows out of contract. It implies sovereignty in each party, for when the sovereignty of the lesser merges in that of the greater, the peculiar relation ceases. Any occupation, therefore, by the English, at any time must have been (by their own showing) as under Mosquito. Any possession must have been the possession of Mosquito. And when that possession is demonstrated to be, not adverse to, but under Spain, their title, being that of a privy in estate, must take the same course.

Any light in which we view the claim presents a tissue of inconsistencies. To defeat the Spanish title it is alleged that the Indians are an independent nation, whom Spain could never conquer; while, on the other hand, to let in Great Britain to the benefit of such a defeat, it is said that her protection is necessary to enable them to protect themselves against the Spaniard. Either they are an independent nation of themselves, capable of existing without this protection, and therefore not entitled to it, or the aid has been rendered in bad faith to maintain a tribe of savages in revolt against their sovereign.

The contemporaneous construction of the treaty of Madrid shows that the right of Spain to the whole of Central America was not questioned. Sir William Godolphin, the ambassador to Spain, who negotiated and signed the treaty on the part of Great Britain on the $\frac{10}{20}$ May, 1672, wrote to Lord Arlington from Madrid as follows:

> Your Lordship hath required my opinion touching the cutting of logwood in the West Indies by some English on pretence that the Parts where they take the same are not Inhabited or Possessed by the Spaniards. * * * * In answer, * * * the said wood is brought from Yucatan a large Province of New Spain, extending into the North Sea like to a Peninsula ab't a hundred leagues in length, sufficiently Peopled in respect of other places of those Indies having several good Towns as Merida Valladolid, San Francisco de Campeche &c., the Govern't thereof being likewise esteemed one of the most considerable there next to the two Vice Royaltyes of Peru and Mexico. * * * * Now this wood growing on the northern coast of Yucatan * * * * * is commonly called here Campeche wood. * * * This premised we may reasonably conclude the Crowne of Spayne to have as well too much right as advantage in these woods, not to assert the Propriety of them, for though perhaps they are not all inhabited (which is not to be admired) or distinguished into particular Tenements, but remaine in common, yet they are in generall possessed by these People who may as justly pretend to make use of our Rivers Mountains, and other commons, for not being inhabited or owned by individual Proprietors, as we can to enjoy any benefit of those woods.
>
> And this is the sense of all the Spaniards, who esteeme themselves in full possession of every part of that Province, notwithstanding that it containeth much Territory unpeopled, since (as I have said) to inhabit and possess are distinct, neither is the former essentiall to the latter.
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> * * * * * * *
>
> Lastly what will render the pretension to a freedome of cutting this wood more odious to the Spaniards is, that in consequence thereof, and for the same reason wee may inferre a liberty to inhabit there, opening a doore to any farther attempt wee may designe against theere continent.
>
> * * * * * * *
>
> Thus much to the merritts of the cause, & the point of strict justice.
>
> But now, after all this, I will adventure to give my opinion, that if the English in the cutting wood at Campeche would restrain themselves to that alone, observing to doe it in parts neerest to the sea, more remote from their Towns * * * and without making inroads or other depredations on the Country, it may be adviseable for his Maj'y, though not to authorize yet to connive * * * sure for when they [the Spaniards] see the American Treaty in other points punctually complyed with and no other spoyle committed than the bare cutting of that wood * * * they may be induced to connive likewise.

When it is remembered that up to this time all geographies conceded, or rather never doubted, the right of Spain to the whole of this part of the continent, that that right had been intruded on only by the buccaneers, and that these intrusions had been confined to Yucatan and its neighborhood, and had not yet extended as far south as Mosquito, which was a part of New Spain, of which "the Spaniards then esteemed themselves in full possession of every part," the completeness of the testimony will be understood and its almost prophetic nature appreciated. And I am prepared to show, in addition, that the connivance of the governors of Jamaica in such cutting and encroachment was encouraged and approved in London.

I shall now assume it to be clearly proved that in 1670, while the English had no right, either directly or indirectly, in Mosquito, Spain held undoubted sovereignty over it, and shall travel forward to the year 1739, when hostilities commenced between Great Britain and Spain, during which a permanent occupation of this country by the former power was for the first time attempted. Most of the acts of occupation or protection (for they sometimes take the one form and sometimes the other) on the part of England took place between this date and the peace of Paris in 1763, and were either done during a time of hostilities or were themselves causes of a subsequent war. It is plain, therefore, that, being aggressive, they cannot now be used by Great Britain to set up the alleged title in the Indians.

On the 19th of October, 1739, war was declared against Spain, ostensibly because she had neglected to pay the paltry balance of £95,000 according to treaty; but the real object of the British colonists appears to have been to gain a stronger footing in the West Indies before concluding a peace. On the 17th of August, 1740, Sir William Pultney, of the Admiralty, wrote to Admiral Vernon, then in the West Indies, a long letter, detailing the plans of the Government. He says:

> To ravage the coast of Spain (supposing we could do it) seems to be with a desire only of forcing the Spaniards into a peace before we have secured such advantage as we may reasonably hope for in another place. Every man of sense agrees that the only place to push them in is the West Indies, and there we can be too hard for them, and may defy the whole world besides. * * * We [England] one and all cry out there is no dependence on the faith of treaties. Something must be done to keep the Spainards from insulting us again, and we must no longer rely on bare promises only for the security of our navigation and commerce. Take and hold, is the cry. This plainly points to Cuba. * * * It [the taking of Carthagena] might be a very sensible mischief to Spain, but what we now immediately want is advantage to ourselves. * * * When we are once possessed of it [Cuba] the whole world will not be able to dispossess us again. We may then make peace with Spain without the intervention of France, giving them almost anything in Europe they may desire, but showing them at the same time they shall in great measure depend upon us, the chief maritime power, and convincing them of the truth of their own old proverb: *Peace with England and war with the whole world.*

During the years 1739 and 1740 many projects were framed for the purpose of gaining the desired footing in the West Indies, for the accounts of the wonderful details of which we are indebted to the principal actors in them, many of whose most confidential letters, owing to private quarrels, have been published. In addition to these, I have been permitted to examine the original Vernon and Wager manuscripts, a collection embodying in the original official as well as private letters of the Duke of Newcastle, of Sir Charles Wager, of Admiral Vernon, of Sir William Pulteney, of Governor Trelawney, of Mr. Robert Hodgson, and of many others, a mass of authentic information never published, and not existing anywhere else, unless in her Majesty's state-paper office. I am happy to say that this collection will probably go to America, as it is now owned by an American gentleman.

As soon as hostilities were determined upon, the Duke of Newcastle (on the 15th of June, 1739) directed Governor Trelawney to be on his guard against any attempt of the Spaniards against Jamaica, and gave him full power and liberty to annoy the enemy. He directed him also to encourage the taking out of letters of marque and reprisal against the Spaniards, and to authorize descents upon the Spanish settlements.

On the receipt of these orders, Governor Trelawney at once revived the old scheme of the Mosquito Indians, and on the 20th January, 1739–'40, wrote to the Duke of Newcastle, advising a settlement upon the Mosquito shore. About one hundred Englishmen, he said, were there, "mostly such as could live nowhere else." He proposed to bring all the English in that quarter together in one settlement, so that by the help of the Mosquito Indians, whom he calls his "friends," they might induce the neighboring Indians to revolt, and thus by supporting the Indians "a little, spread the revolt from one part to another till it should be general over the Indies, and drive the Spaniards entirely out or cut them off." Accordingly, early in 1740 he commenced his Quixotic scheme by sending one Robert Hodgson to the Mosquito shore, fully equipped with everything necessary to enable him to tamper with the Indians and excite them against the Spaniards. I am fortunately able to give from the Vernon manuscripts Mr. Hodgson's own account of what he did under this extraordinary commission:

SANDY BAY, *April* 8, 1740.

May it please your excellency: * * *

King Edward, being informed of my arrival, sent me word that he would see me the next day, which he did, attended by several of his captains. I read to him your excellency's letter and my own commission, and when I had explained them by an interpreter, told my errand, and recommended to them to seek all opportunities of cultivating friendship and union with the neighboring Indian nations, and especially such as were under subjection to the Spaniards, and of helping them to recover their freedom. They approved everything I said, and appointed the 16th to meet the governor, John Briton, and his captains at the same place, to hear what I had further to say.

On the 16th they all came, except Admiral Dilly and Colonel Morgan, who were sick. General Hobby and his captains were at too great a distance to be sent for, but, their presence not being material, I proceeded to acquaint them that, as they had long acknowledged themselves subjects of Great Britain, the governor of Jamaica had sent me to take possession of their country in his majesty's name; then asked if they had anything to object. They answered they had nothing to say against it, but were very glad I was come for that purpose; so I immediately set up the standard, and, reducing the sum of what I had said into articles, I asked them both jointly and separately if they approved and would abide by them. They unanimously declared they would; so I had them read over again in a solemn manner under the colors, at the end of every article fired a gun, and concluded with cutting up a turf, and promising to defend their country and to procure them all the assistance and instruction from England in my power.

The formality all this was done with seemed to have a good influence upon them, for they often repeated their desire of learning to read, and said they must now mind their kings more than they had done, and do all they could to help themselves and hurt the Spaniards, to whom I recommended all the mercy that was consistent with their own safety; but they seemed not to understand me rightly, saying if they fight they must kill. The articles I inclose, and hope your excellency will excuse so much ceremony, for, as I had no certain information whether the country was ever taken possession of before or ever claimed otherwise than by sending them down commissions, I thought the more voluntary and clear the cession of it was the better. The governor came attended with a numerous guard, who behaved to him with much respect and *silence*. He is a sensible old man, and carries a good command. The king being very young, I believe not twenty, is not much observed, but was he to be a while in Jamaica or England 'tis thought he would make a hopeful monarch enough.

* * * * * * *

The same day Admiral Dilly and Colonel Morgan sent me word they were coming to wait on me. I immediately crossed the lagune to meet them, hearing they were sensible, clever fellows, and such I found them. They had dispatched a messenger to the governor to meet them the next day, to hold a general and decisive council.

They all met on Sunday, the 23d, at Senock Dawkra (Mr. Whitehead's house). The

governor, being sick, tried our patience by making us wait till the afternoon, but when he came made ample amends by the justness of his sentiments.

He told the king and his captains it was plain they had got a name and the good opinion of the governor of Jamaica (whose success against the rebellious negroes they had all heard of), and if they did not keep it up what would the world say of them? There was an officer now sent down by your excellency to observe their manner of fighting, and if they did not do their best they should lose the favor of the English. It was true they were but a small number of people, compared to us, who had men to spare for sickness and the sword, but if they showed themselves worthy, no doubt the King of Britain would sent a force sufficient to get them all they wanted, besides teachers to instruct them in what is right and good. He said General Hobby had often talked about taking towns in time of peace, and called the English cowards. Now it was war they must show they were not such themselves; that the English were the best judges when war or peace was proper; and none of them had any business to act otherwise than they were directed by the governor of Jamaica. * * * *

I find my council about sobriety has had some weight with the old men, but the young ones are got together there since with the women into drinking-bouts. They intoxicate themselves with a liquor made of honey, pine-apples, and cassada, and if they avoid quarrels, which often happen, they are sure to have fine promiscuous doings among the girls. The old women, I am told, have the liberty of chewing the cassada before 'tis put in, that they may have a chance in the general rape as well as the young ones.

I fell into one of them by mere accident last Monday, where I found Admiral Dilly and Colonel Morgan, retailing my advice among them, to little effect, for most of them were too drunk to mind it, and so hideously painted that I quickly left them to avoid being daubed all over, which is the compliment they usually pay their visitors on those occasions.

Those two captains complain much of their drinking, but say it has been taught them by the English; others say not, for how should the English invent the pine and cassada drink? Their resentment of adultery has lost its edge, too, more than among other Indians; that, I make no doubt, they are obliged to us for. Their breach of promises in their bargains I take to be a good deal owing to a sense of being defrauded by traders, but through their ignorance of numbers and value, not being able to tell how, they are apt to make improper reprisals. As for their laziness, the grand promoter of the rest, I really think it must have been owing to their discontent at the usage they have received from privateers and others, because I don't find it has been epidemical amongst them till lately.

* * * * * * *

I have disposed of several presents, but their returns being chiefly in visits to get more or to drink punch, I have stopped my hand. The Lubeck duck osnaburgs, powder, ball, flints, and shot I shall divide among them at setting out, with a promise that they shall pay me according to their behavior or their plunder. * * *

ROBT. HODGSON.

APRIL 12, 1740.

P. S.—Had I been better informed, I might have made a little fortune out of your excellency's money and done more justice to the cause, for the Mosquito men have not got half guns enough, so must be supplied by Stewart and the other white men that go with us, who, no doubt, will make them pay sound.

* * * * * *

The origin, character, history, and results of the British intrigues in this quarter are all disclosed in this letter. They originated in public and private cupidity, in the desire of territorial aggrandizement, and of personal gain to the governor of Jamaica. They were pursued in the same spirit by the distribution of intoxicating liquors and missiles of destruction among the savages, and by exciting them to an unnatural war against the Spaniards. They resulted in the complete degradation of the Indians themselves, a degradation which they have never been able to shake off. Yet this is the "protection" Great Britain sets up and seeks to perpetuate.

Mr. Hodgson skillfully aroused the old resentment of the Indians against the Spaniards, and induced them to join him in an expedition which proved a failure. He, however, remained among them, and was instructed by Governor Trelawney "to endeavor to persuade the Indians to form themselves into some sort of a government."

Meanwhile the home government had the scheme under consideration, and approved of it. But Sir Charles Wager had fallen in with another adventurer, named Lee, and wrote to Admiral Vernon from the admiralty office as follows, under date May 23, 1741:

> I sent Governor *Trelawney*, by the last ships, some accounts I had from one Captain Lee, who was some time a factor to the South Sea Company, at *Guatimalla*, of the particular situation, riches, and trade of that part of the continent, which is much more than I imagined. The governor's *Don Quixotte*, Mr. Hodgson, seemed to want this Captain Lee with him, and I could have seen him had it not been for some difficulties, but I had his scheme in writing, and sent it to *Plymouth*, but the ships were gone before it came there.

Again, on the 18th of August following, he wrote to the admiral thus:

> I sent you by the last ships a scheme of Captain Lee for a proper number of soldiers, when they can be spared or can do nothing more considerable, to go down to the Mosquitos, and, with or without them, to make attempt on the Spaniards up the river Dulce, where Captain Lee seems perfectly acquainted; but as we have made him captain of the *Bonetta* sloop, purely for the sake of this scheme only, I refer you to him for a clear explication of the whole scheme, which in its consequences may be much more considerable than it appears at first sight, for if we can procure a sufficient number of arms for the *Indians*, who are able and willing, as he says, to pay for them, though that is not material, they would soon make themselves their own masters, and drive all the *Spaniards* out of the country, or change conditions with them and make them the hewers of wood and drawers of water; and this I think they may do, if supplied with arms and all things necessary, *more easily than the Spaniards conquered them* [the italics are mine except the word Spaniards], for if once there was a considerable insurrection of the *Indians* about *Guatimalla* and that country, in which the *Mosquito* men may perhaps be persuaded to join with them, there would soon be an insurrection both in *Mexico* and *Peru*, of which the *Spanish* court has been very much afraid, especially in *Peru* and *Chili*, where it is not improbable but the *Creole Spaniards* would soon join with them and set up a king of their own.

Again on the 20th of the same month, and still again on the 7th of October following, he wrote to Admiral Vernon, reiterating these views in almost the same language. These letters, as well as that of Mr. Hodgson, expose the manner and the object of the British tampering with the Indians.

In 1743 these "schemes" had so far progressed that Governor Trelawney recommended that a company of troops should be kept at the Mosquito shore, and that some sort of government should be established there, and the governor encouraged emigration there, and tried to get permission from the government to grant lands, and thus induce settlement. But the board of trade did not approve of this.

On the 19th of July, 1744, notwithstanding the discouraging report of the board of trade as to the rights of Spain, an order passed the council detaching a certain number of troops from Jamaica for the Mosquito shore, and providing for the erection of forts and the establishment of a government. In February, 1748, there was another order in council for sending a supply of ordnance to the new settlement on the Mosquito shore to the amount of £1,528 13*s*. 7*d*.

The fort at Black River was completed in 1747, so that Governor Trelawney was confident that should the Spaniards make a descent upon Mosquito shore, as was expected in the summer of 1748, it "would be able not only to defend itself, but to annoy the enemy."

During all this time (*i. e.*, from 1739 to the peace of Aix la Chapelle) I do not learn that the Spaniards made any direct attempt to dislodge the English from the Mosquito shore, except by an expedition from Nicaragua in 1747, which was a failure. The reason was they were busily engaged in more important places.

Matters were not changed by this peace. The English gained no new rights. They, nevertheless, determined to maintain their settle-

ment, and in October, 1749, the king appointed Captain Hodgson "to regulate and superintend the settlement on the Mosquito shore, which has been subsisting several years under the protection of our friends and allies, the Mosquito Indians." Captain Hodgson was to put himself under the direction of the governor of Jamaica, and to correspond with him. One cannot but admire the facility with which the relation of the Indians shifts from protectors to protected to suit the exigencies of the case.

In 1750 and 1751 the Spanish authorities remonstrated against these proceedings, asserted their rights, and threatened an expulsion of the English. Governor Trelawney, alarmed at the aspect of affairs, sent Hodgson an artful set of instructions for his conduct towards the Indians, which were to be shown to the President of Guatemala, to cause him to believe that the object of the English in keeping a superintendent among the Indians was to restrain them in their hostilities against the Spaniards; but upon their being presented to him he protested against the English interference, and proposed sending a Spanish agent or governor among the Indians. In reply, Hodgson wrote to him on the 3d of December, 1750, that he was already there as a superintendent, appointed by the governor of Jamaica to protect the Spaniards, as they could not protect themselves, and asserted that the Indians were free, never having been conquered by Spain.

In 1757 an attack by the Spaniards was apprehended at the shore, but only a missionary was sent among the Indians, named Juan Joseph Solis de Meranda, who reported that hostilities would not be commenced if he were allowed to remain among the Indians. This was at first granted; but the English, soon perceiving the influence he was gaining over the natives, to their great prejudice, arrested him under the pretense of his being an impostor, and sent him to Jamaica.

It now came to the knowledge of the governor of Jamaica that the Spaniards were making preparations for invading the Mosquito shore and driving the English from it. The settlers became alarmed and demanded that the detachment of soldiers should be withdrawn. The governor, on his part, proposed that the fort should be demolished rather than give umbrage to the Spaniards.

In 1752 Governor Knowles succeeded Governor Trelawney. He took a different view of the rights of the Mosquito Indians, restored Father Solis, and seemed determined to expose these transactions. He entered into a correspondence with the governor of Guatemala, and proposed a cessation of hostilities till he could hear from England. On the 26th of March, 1753, he wrote to the secretary of state that the settlement on Mosquito shore was "a job"; that if Captain Hodgson was not checked or recalled he "would involve the nation in difficulties"; that the Indians were so perplexed they "did not know which part to take"; and that he should advise withdrawing the troops unless the ministry intended to maintain the right to the territories, which he thought was not worth contending about.

During Governor Knowles's administration the condition of things improved, but he was not allowed to remain long. On his departure they fell back into the old channel, the English covertly acting the part of aggressors, the Spaniards resisting by protest and by force, until the treaty of Paris in 1673; except that in 1759 the Indians took up arms against the English, being discontented with their treatment of them and disgusted with the course of Captain Hodgson, and except also that this latter year was signalized by a communication from the board of trade ignoring the existence of any British settlement on the Mos-

quito shore, and declining, therefore, to entertain complaints against officers of the crown for acts done there.

The treaty of Paris assumes to define the respective rights of the parties in Central America. By Article XVII it is provided that "His Britannic Majesty shall cause to be demolished all fortifications which his subjects shall have erected in the Bay of Honduras, *and other places of the territory of Spain in that part of the world*, &c., and then the right is given to the English to cut logwood on the "Spanish coasts and territories." In accordance with this provision, all the British fortifications in Mosquito were demolished and the troops removed. But the settlers remained both there and in Honduras for the purpose of cutting and carrying away logwood, and marked their residence by repeated aggressions, similar to those already described, which I can give you in detail if you desire it. In 1783, at the close of the contests which accompanied the American Revolution, it was found necessary to define more particularly the rights of the English cutters, which is accordingly done by the sixth article of the treaty of Versailles, where it is provided that, "the intention of the two high contracting parties being to prevent as much as possible all the causes of complaint and misunderstanding heretofore occasioned by the cutting of wood for dyeing, or logwood, and several English settlements having been formed and extended under that pretense upon the Spanish continent, it is expressly agreed that His Britannic Majesty's subjects shall have the right of cutting," &c. (defining the limits about the Belize within which the right might be exercised), "and His Catholic Majesty assures to them the enjoyment of all that is expressed within the present article, *provided that these stipulations shall not be considered as derogating in any wise from his rights of sovereignty.*" And then it was provided that within eighteen months from the ratification the English should wholly retire from the Spanish continent and islands to the space allotted to them. This the English were understood at the time to have received as a compensation for abandoning Mosquito.

It is now claimed by Great Britain that before the conclusion of this treaty Mosquito had become an independent nation, and therefore was not embraced within its provisions. The argument upon which this is founded involves the consideration of the English title.

Starting from the position that the Indians had never been conquered, and therefore were not within Spanish jurisdiction (the fallacy of which I have already shown), all English writers rely on three, and only three, circumstances to establish the Mosquito protectorate, all of which are stated by Lord Palmerston in his note to Mr. Castellon of July 16, 1849: 1st. A submission by the Mosquito King to the governor of Jamaica on behalf of the King of England in 1687, founded on an alleged prior submission between 1645 and 1660. 2d. A convention between the governor of Jamaica and the King of the Mosquitos, concluded June 25, 1720. 3d. Certain reports and resolutions made in 1774 in the house of assembly of Jamaica.

To all this I might reply that the Mosquitos could not of themselves change their political connection; that, not being an independent nation, all acts done by them as such are void; that the demolition of fortifications shows England's construction of the treaty of Paris; and that the treaty of Versailles uses the broad language of the "*Spanish continent*," and affirms Spanish sovereignty. Without dwelling on these apparent considerations, I turn to the authorities relied upon for these positions.

And as to the first, I find that all writers refer for proof to an account of the matter given by Sir Hans Sloane, who was in Jamaica at the time

of the alleged submission to the Duke of Albemarle, the governor, and was his family physician, and of course in a position to know all about it. The authority most often cited is a memoir by Bryan Edwards, entitled "Some account of the British Settlements on the Mosquito Shore, drawn up for the use of Government in 1773." The history of this memoir is a little curious. It purports to have been drawn up for the use of government in 1773. It was printed anonymously, and was in 1776 "laid before Parliament" with the case of the Morning Star, to which I shall soon allude. The treaties of 1783 and 1786 having been concluded, the subject dropped. Twenty years afterwards, Mr. Edwards published his "History of the West Indies," in one of the foot-notes to which he states that *the settlement in Mosquito having been surrendered to Spain by the treaty of* 1786, it did not come within the plan of his work to treat of them, but referred all curious on this subject to this memorial. In 1819, in the fifth edition of his history (the first published after his death), this memorial was for the first time printed with the history, and under his name. It is now reproduced by the Foreign Office in the "correspondence," &c., on this subject, submitted to Parliament in 1848. That you may see how history has been perverted, I give you in parallel columns what Sir Hans Sloane really did say (copied from his printed history) and what Mr. Edwards represents him as saying:

SIR HANS SLOANE.

One King Jeremy came from the *Mosquitos* (an *Indian* People near the Provinces of *Nicaragua*, *Honduras*, and *Costa Rica*). He pretended to be a king there, and came from the others of his country, to beg of the Duke of *Albemarle*, governor of Jamaica, his *Protection*, and that he would send a Governor thither with a power to war on the *Spaniards* and Pirats. This he alleged to be due to his country from the Crown of *England*, who had in the reign of King *Charles* I submitted itself to him. The Duke of *Albemarle* did nothing in this matter, being afraid it might be a trick of some people to set up a Government for Bucaniers or Pirats. This *King Jeremy*, in coming to Town, asking many questions about the Island, and not receiving as he thought, a satisfactory account, he pulled off his *European* cloaths his friends had put on, and climb'd to the top of a tree to take a view of the country.

The memorial and substance of what he, and the people with him, represented to the Duke of *Albemarle*, was, That in the reign of King *Charles* I of ever Blessed memory, the Earl of Warwick (by virtue of letters of reprisal granted by his said majesty for damages received from the Subjects of his Catholic majesty) did possess himself of several islands in the West *Indies*, particularly that of *Providence* (since called by the *Spaniards St. Catalina*) which is situate in 13 deg. 10 m. N. Lat., lying East from *Cape Gratios de Dios* (vulgarly known by the name of the *Muskitos*) between Thirty and Forty leagues: which put the said Earl upon trying all ways and means of future correspondence with the natives of the said Cape, and neigh-

MR. EDWARDS.

The memorial and substance [says Sir Hans] of what he (the Mosquito King) and the people with him represented to the Duke of Albemarle was that in the reign of Charles I. the Earl of Warwick, by virtue of letters of reprisal, possessed himself of several islands in the West Indies, particularly that of Providence (since called by the Spaniards St. Catalina), which is situated 13° 10 m. N. lat., lying east from Cape Gracios a Dios (vulgarly known by the name of the Mosquitos) between thirty and forty leagues, which put the said Earl upon all ways and means of future correspondence with the natives of the said cape and neighboring country: and in some little time he was so successful as to gain that point,

boring country, and in some little time was so successful as to gain that Point, and further prevailed with them so far, as to persuade them to send home the King's son, leaving one of his People as Hostage for him, which was Col. Morris, now living at New York. The *Indian* Prince going home with the said Earl, staid in *England* three years, in which time the *Indian King* died, and the said natives having in that time had intercourse of Friendship and Commerce with those of *Providence* were soon made sensible of the grandeur of his Majesty of *Great Britain* and how necessary his Protection was to them. Upon the return of the said *Indian* Prince, they persuaded him to resign up his authority and power over them, and (with them) unanimously declare themselves the subjects of his said Majesty of Great Britain, in which opinion they have ever since persisted, and do own no other Supreme command over them.

and prevailed with them so far as to persuade them to send home the King's son, leaving one of his people as a hostage for him, which was Col. Morris, now living in New York. The Indian prince, going home with the said Earl, staid in England three years, in which time the Indian king died, and the natives, having in that time intercourse and commerce with those of Providence, were soon made sensible of the grandeur of his Majesty of Great Britain, and how necessary his protection was to them. Upon the return of the said Indian Prince, they persuaded him to resign up his authority and power over them, and with them unanimously declare themselves the subjects of his said Majesty of Great Britain: in which opinion [continues Sir Hans] they have ever since persisted, and do own no other supreme command over them.

I am sure you will agree with me that a worse perversion of history than this can scarcely be found elsewhere. The original authority, when produced, states expressly that the Duke of Albemarle did nothing in the matter. Mr. Edwards suppresses the fact that Lord Warwick's expedition was hostile to Spain; and the opinion attributed to Sir Hans at the close of the extract is found to be not his, but the language of the memorial.

But I am able to go a step further in the history of this curious title, and show the equivalent which the Indian Esau received for his birthright. In a pamphlet first published in 1699 (eight years before the publication of Sir Hans Sloane), and afterwards republished in the sixth volume of Churchill's Voyages, containing an account of the Mosquito shore from a very intelligent person, evidently well acquainted from observation, is the following passage:

> He [the King] says that his father, *Oldman*, King of the Mosquito men, was carried over to England soon after the conquest of Jamaica, and there received from his brother King a crown and commission, which the present *Old Jeremy* still keeps safely by him, *which is but a cocked hat, and a ridiculous piece of writing that he should kindly use and relieve such struggling Englishmen as should choose to come that way with plantains, fish, and turtle, &c., &c.*

The words that I have italicised in the latter part of this extract need no comment.

As to the second fact now alleged, I have only to say that the "convention" is published in the Mosquito correspondence submitted to Parliament in 1848; and so far from proving any sovereignty in the Indians, shows the contrary. It is neither treaty nor convention. It is a *contract* between King Jeremy on the one side, signed with "his mark," and Governor Lawes on the other, *sealed with the* PRIVATE *seals of both parties*, by which the King contracts to furnish fifty men to hunt negroes, and the governor to pay for them and give them "rum" enough for the voyage home; very similar to the contract made subsequently with the Spanish hunters of Cuba for the employment of bloodhounds for the same purpose. This is not the mode in which high contracting parties usually deal with each other. Any argument deduced from it is founded in an ignorance of the distinction between a sovereignty in the soil and a dominion over the persons of the savages composing the tribe.

As to the third fact, without stopping to dwell on its *ex-parte* character, I have reason to think that the move was made in Jamaica at the instance, among others, of this Mr. Edwards, who drew up, to further it, the memorial above alluded to. To show how little the government at home entered into it, in 1776 a vessel called the Morning Star, with certain Indians on board, who had been to England to aid in putting down the practice of selling the Indians into slavery, was seized by the Spanish Guarda Costas on its return to Mosquito. The owners brought the subject before Parliament, presenting with their petition Mr. Edwards' memorial. After a long debate, in which it was asserted that the seizure was justifiable, as the treaty had been violated, Parliament refused to entertain the subject.

I have now examined the only evidence adduced in support of the English claim to a protectorate, and, unless I deceive myself, it dwindles into insignificance. I now resume the historical thread.

The English settlers were lax in conforming to the provisions of the treaty of 1783, the territory allotted to them being found to be too small, and the eighteen months passed away without their removal. Spain began to complain of this infraction, and the result was the treaty of 1786, which, besides, enlarging the territory to be occupied by the English, and making various regulations about it, contains the following provisions:

I. His Britannic Majesty's subjects, and the other colonists who have hitherto enjoyed the protection of England, shall evacuate the country of the Mosquitos, &c.

XI. * * * In this view His Britannic Majesty engages to give the most positive orders for the evacuation of the country above mentioned by all his subjects, of whatever denomination; but if, contrary to such declaration, there should still remain any persons so daring as to presume, by retiring into the interior of the country, to endeavor to obstruct the entire evacuation already agreed upon, His Britannic Majesty, so far from affording them the least succor, or even protection, will disavow them in the most solemn manner, as he will equally do those who may hereafter attempt to settle upon *the territory belonging to the Spanish dominion.*

XIV. His Catholic Majesty, prompted solely by motives of humanity, promises to the King of England that he will not exercise any act of severity against the Mosquitos inhabiting in part the countries which are to be evacuated by virtue of the present convention on account of the connections which may have subsisted between the said Indians and the English. * * *

This was looked upon as an abandonment by England. It was so avowed in Parliament in a debate on a motion to impeach the ministry. Bryan Edwards admits it in the foot-note cited above. The Mosquito settlers themselves considered it so, and put in a claim to Parliament for damages, which was allowed. Extracts from their statement of the grounds of their claim have found their way into the appendix to the Mosquito correspondence of 1848, under the title of "Extracts from McGregor's Commercial Tariffs, Part XVII."

Still later, in the Quarterly Review for October, 1822, article VIII, in a review of a work on Mosquito Shore by one Captain Strangeway, is the following strong language. After saying that—

The whole of the Mosquito Shore and Honduras and the town of Poyais have for many centuries belonged to Spain, and have been considered as constituent portions of the kingdom of Mexico, not one foot of which was ever held by the English, except occasionally during a war, by the buccaneers, or more recently by the logwood cutters;

and reviewing the treaties of 1783 and 1786, the writer says:

Nothing can more clearly establish the sole right of Spain to these territories than the treaty and convention above mentioned. We never had any business there. The simple fact is that the Mosquito Indians have always borne an inveterate dislike to the Spaniards. The Duke of Albemarle, when governor of Jamaica, fostered that dislike, and invested one of the Indians with a commission as chief of the Mosquitos, under the protection of England; a foolish ceremony, which was exercised long after

by his successor, just as we now make King Toms and King Jacks among the negroes of Western Africa; but, if treaties are to be considered as at all binding, it is quite clear that we have not the right, nor even the permission of residence on the Mosquito Shore, and that we cut logwood and mahogany on the shores of Honduras Bay only by sufferance.

It is worthy of remark that in a reply to the Review, published in 1823, is the admission that "this territory belongs to Spain."

* * * * * * *

I have, &c.,

ABBOTT LAWRENCE.

24.—*Clayton-Bulwer treaty of April* 19, 1850.

The United States of America and Her Britannic Majesty, being desirous of consolidating the relations of amity which so happily subsist between them, by setting forth and fixing in a convention their views and intentions with reference to any means of communication by ship-canal which may be constructed between the Atlantic and Pacific Oceans by the way of the river San Juan de Nicaragua and either or both of the Lakes of Nicaragua or Managua, to any port or place on the Pacific Ocean, the President of the United States has conferred full powers on John M. Clayton, Secretary of State of the United States, and Her Britannic Majesty on the Right Honorable Sir Henry Lytton Bulwer, a member of Her Majesty's most honorable privy council, knight commander of the most honorable Order of the Bath, and envoy extraordinary and minister plenipotentiary of Her Britannic Majesty to the United States, for the aforesaid purpose; and the said plenipotentiaries having exchanged their full powers, which were found to be in proper form, have agreed to the following articles:

ARTICLE I.

The Governments of the United States and Great Britain hereby declare that neither the one nor the other will ever obtain or maintain for itself any exclusive control over the said ship-canal; agreeing that neither will ever erect or maintain any fortifications commanding the same or in the vicinity thereof, or occupy, or fortify, or colonize, or assume, or exercise any dominion over Nicaragua, Costa Rica, the Mosquito coast, or any part of Central America; nor will either make use of any protection which either affords or may afford, or any alliance which either has or may have to or with any state or people, for the purpose of erecting or maintaining any such fortifications, or of occupying, fortifying, or colonizing Nicaragua, Costa Rica, the Mosquito coast, or any part of Central America, or of assuming or exercising dominion over the same; nor will the United States or Great Britain take advantage of any intimacy, or use any alliance, connection, or influence that either may possess with any state or government through whose territory the said canal may pass, for the purpose of acquiring or holding, directly or indirectly, for the citizens or subjects of the one, any rights or advantages in regard to commerce or navigation through the said canal which shall not be offered on the same terms to the citizens or subjects of the other.

ARTICLE II.

Vessels of the United States or Great Britain traversing the said canal shall, in case of war between the contracting parties, be exempted from

blockade, detention, or capture by either of the belligerents; and this provision shall extend to such a distance from the two ends of the said canal as may hereafter be found expedient to establish.

ARTICLE III.

In order to secure the construction of the said canal, the contracting parties engage that if any such canal shall be undertaken upon fair and equitable terms by any parties having the authority of the local government or governments through whose territory the same may pass, then the persons employed in making the said canal, and their property used, or to be used, for that object, shall be protected, from the commencement of the said canal to its completion, by the Governments of the United States and Great Britain, from unjust detention, confiscation, seizure, or any violence whatsoever.

ARTICLE IV.

The contracting parties will use whatever influence they respectively exercise with any state, states, or governments, possessing or claiming to possess any jurisdiction or right over the territory which the said canal shall traverse, or which shall be near the waters applicable thereto, in order to induce such states or governments to facilitate the construction of the said canal by every means in their power. And furthermore, the United States and Great Britain agree to use their good offices, wherever or however it may be most expedient, in order to procure the establishment of two free ports, one at each end of the said canal.

ARTICLE V.

The contracting parties further engage, that when the said canal shall have been completed, they will protect it from interruption, seizure, or unjust confiscation, and that they will guarantee the neutrality thereof, so that the said canal may forever be open and free, and the capital invested therein secure. Nevertheless, the Governments of the United States and Great Britain, in according their protection to the construction of the said canal, and guaranteeing its neutrality and security when completed, always understand that this protection and guarantee are granted conditionally, and may be withdrawn by both governments, or either government, if both governments, or either government, should deem that the persons or company undertaking or managing the same adopt or establish such regulations concerning the traffic thereupon as are contrary to the spirit and intention of this convention, either by making unfair discriminations in favor of the commerce of one of the contracting parties over the commerce of the other, or by imposing oppressive exactions or unreasonable tolls upon passengers, vessels, goods, wares, merchandise, or other articles. Neither party, however, shall withdraw the aforesaid protection and guarantee without first giving six months' notice to the other.

ARTICLE VI.

The contracting parties in this convention engage to invite every state with which both or either have friendly intercourse to enter into stipulations with them similar to those which they have entered into with each other, to the end that all other states may share in the honor and advantage of having contributed to a work of such general interest and importance as the canal herein contemplated. And the contracting parties likewise

agree that each shall enter into treaty stipulations with such of the Central American States as they may deem advisable, for the purpose of more effectually carrying out the great design of this convention, namely, that of constructing and maintaining the said canal as a ship communication between the two oceans for the benefit of mankind, on equal terms to all, and of protecting the same; and they also agree, that the good offices of either shall be employed, when requested by the other, in aiding and assisting the negotiation of such treaty stipulations; and should any differences arise as to right or property over the territory through which the said canal shall pass between the states or governments of Central America, and such differences should in any way impede or obstruct the execution of the said canal, the Governments of the United States and Great Britain will use their good offices to settle such differences in the manner best suited to promote the interests of the said canal, and to strengthen the bonds of friendship and alliance which exist between the contracting parties.

ARTICLE VII.

It being desirable that no time should be unnecessarily lost in commencing and constructing the said canal, the Governments of the United States and Great Britain determine to give their support and encouragement to such persons or company as may first offer to commence the same, with the necessary capital, the consent of the local authorities, and on such principles as accord with the spirit and intention of this convention; and if any persons or company should already have, with any state through which the proposed ship canal may pass, a contract for the construction of such a canal as that specified in this convention, to the stipulations of which contract neither of the contracting parties in this convention have any just cause to object, and the said persons or company shall moreover have made preparations, and expended time, money, and trouble, on the faith of such contract, it is hereby agreed that such persons or company shall have a priority of claim over every other person, persons, or company to the protection of the Governments of the United States and Great Britain, and be allowed a year from the date of the exchange of the ratifications of this convention for concluding their arrangements, and presenting evidence of sufficient capital subscribed to accomplish the contemplated undertaking; it being understood that if, at the expiration of the aforesaid period, such persons or company be not able to commence and carry out the proposed enterprise, then the Governments of the United States and Great Britain shall be free to afford their protection to any other persons or company that shall be prepared to commence and proceed with the construction of the canal in question.

ARTICLE VIII.

The Governments of the United States and Great Britain having not only desired, in entering into this convention, to accomplish a particular object, but also to establish a general principle, they hereby agree to extend their protection, by treaty stipulations, to any other practicable communications, whether by canal or railway, across the isthmus which connects North and South America, and especially to the inter-oceanic communications, should the same prove to be practicable, whether by canal or railway, which are now proposed to be established by the way of Tehuantepec or Panama. In granting, however, their joint protection to any such canals or railways as are by this article specified, it is always understood by the United States and Great Britain that the

parties constructing or owning the same shall impose no other charges or conditions of traffic thereupon than the aforesaid governments shall approve of as just and equitable; and that the same canals or railways, being open to the citizens and subjects of the United States and Great Britain on equal terms, shall also be open on like terms to the citizens and subjects of every other state which is willing to grant thereto such protection as the Uunited States and Great Britain engage to afford.

ARTICLE IX.

The ratifications of this convention shall be exchanged at Washington within six months from this day, or sooner if possible.

In faith whereof, we, the respective plenipotentiaries, have signed this convention, and have hereunto affixed our seals.

Done at Washington, the nineteenth day of April, anno Domini one thousand eight hundred and fifty.

JOHN M. CLAYTON. [L. S.]
HENRY LYTTON BULWER. [L.S.]

25.—*Sir H. L. Bulwer to Lord Palmerston.*

[Extract.]

WASHINGTON, *April* 28, 1850. (Received May 14.)

In my previous dispatch of this day I have informed your lordship of my having concluded a treaty with Mr. Clayton respecting the construction of a ship communication between the two oceans of the Atlantic and Pacific, and I have there stated to your lordship that there are some slight differences between the original project transmitted home on the 3d of February and the treaty now concluded.

I have thought it better to explain the nature of these changes, and my reasons for adopting them, in a separate dispatch; and I shall do so, rather according to the manner and time in which they were made, than according to the place in the convention in which they occur.

The first, therefore, I shall refer to is in Article VI, to which are added the words:

> And should any differences arise as to right or property over the territory through which the said canal shall pass between the states or governments of Central America, and such differences should in any way impede or obstruct the execution of the said canal, the Governments of Great Britain and the United States will use their good offices to settle such differences in the manner best suited to promote the interests of the said canal, and to strengthen the bonds of friendship and alliance which exist between the contracting parties.

This addition, in reconsidering the matter, was deemed, both by myself and Mr. Clayton, an advantage to the treaty, and a sort of guarantee against future unfriendly disputes between the two governments as to the subject referred to.

The second addition agreed to is in Article VII, to which has been added:

> And if any persons or company should already have, with any state through which the proposed ship-canal may pass, a contract for the construction of such a canal as that specified in the convention, to the stipulations of which contract neither of the contracting parties in this convention have any just cause to object; and the said persons or company shall, moreover, have made preparations and expended time, money, and trouble on the faith of such contract, it is hereby agreed, that such per-

sons or company shall have a priority of claim over every other person, persons, or company, to the protection of the Governments of Great Britain and the United States, and be allowed a year from the date of the exchange of the ratifications of this convention for concluding their arrangements, and presenting evidence of sufficient capital subscribed to accomplish the contemplated undertaking, it being understood that if, at the expiration of the aforesaid period, such persons or company be not able to commence and carry out the proposed enterprise, then the Governments of Great Britain and the United States shall be free to afford their protection to any other persons or company that shall be prepared to commence and proceed with the construction of the canal in question.

I should here state to your lordship that, when the treaty was placed under the notice of the chairman of the Committee on Foreign Relations in the Senate, a gentleman of great weight and of the more importance since he belongs to the dominant party in the chamber of which he is a member, considered that it would only be fair that the two governments should give an open and avowed preference by name to an American company which had first conceived and taken steps to carry out the proposed undertaking. This I objected to; but I deemed there could be no objection to giving to any company, under certain fair conditions such as are specified, the preference that was sought, although those conditions applied to a company that was American. In this manner a sort of compromise was effected.

The third alteration adopted is in Article VIII, the whole of which article is remodelled.

This alteration, I must say, was the effect of the joint opinion of Mr. Clayton and myself, both thinking that the article, as amended, was better and more clear, referring especially to two lines of communication which seem the most likely to be adopted, and securing thereby a considerable support to the convention in general, many persons being interested in the Panama and Tehuantepec projects.

The only other change which it is worth while remarking upon occurs the first in the body of the treaty, but was the last mooted or adopted. Your lordship will perceive it by casting your eye over Article I, in which a passage is inserted between the words "Central America," which close the second line in the page, down to "nor will Great Britain or the United States take advantage of any," &c., which occurs in the third line from the bottom of the said page, some few words having been left out to admit of the aforesaid passage. The manner in which this change was effected was as follows:

It struck me that the declaration or note mentioned by your lordship bound our government as to its protection over the Mosquitos, but did not bind the United States Government as to its protection over such other states, even Nicaragua, as it might hereafter form an especial alliance with. Moreover, the pledge that we would not do covertly what we had declared we would not do directly, seemed to me a pledge that it would be more suitable and becoming that both parties should take than that one alone should take.

With these views instead of presenting the note, I embodied in the treaty the substance of the declaration given by your lordship to Mr. Lawrence, constructing that declaration so as to apply to any government or people we do or may protect, and also to any government or people that the United States Government do or may protect. Some discussion took place on this matter, but finally it was so arranged.

As the case now stands it is clearly understood that Her Majesty's Government holds by its own opinions already expressed as to Mosquito, and that the United States does not depart from its opinions also already expressed as to the same subject; but the main question of the canal

being settled on an amicable basis, and the future relations of the United States and Great Britain being regulated in all other parts of Central America, the discussion of this difference, which has lost its great practical importance, is avoided in an arrangement meant to be as much as possible of a perfectly friendly character.

I need not say that should your lordship wish to make any further statement as to the views of Her Majesty's Government with respect to the protectorate of Mosquito, that statement can still be made; nothing in the present convention is affirmed thereupon, but nothing is abandoned.

I trust that after this statement your lordship will approve of the course I have pursued.

There are various small and verbal differences between the original project and treaty which I have not enumerated, because they leave the general sense the same, and have only been adopted to express that sense more clearly. The word "fortify" is inserted between "occupy and colonize" in the second line from the bottom of the page in Article I, but this word had been used in your lordship's note to Mr. Lawrence, and only imposes in that place an obligation which had already been agreed to and stated elsewhere. The word "blockade" is inserted before the words "detention or capture" in Article II, at the request of several influential persons, but only signifies what detention and capture had already expressed.

H. L. BULWER.

Viscount PALMERSTON, G. C. B.

26.—*Declaration made by Sir Henry Bulwer at the Department of State, June* 29, 1850, *prior to the exchange of the ratifications of the Clayton-Bulwer treaty.*

In proceeding to the exchange of the ratifications of the convention, signed at Washington on the 19th of April, 1850, between Her Britannic Majesty and the United States of America, relative to the establishment of a communication by ship-canal between the Atlantic and Pacific Oceans:

The undersigned, Her Britannic Majesty's plenipotentiary, has received Her Majesty's instructions to declare that Her Majesty does not understand the engagements of that convention to apply to Her Majesty's settlement at Honduras, or to its dependencies.

Her Majesty's ratification of the said convention is exchanged under the explicit declaration above mentioned.

Done at Washington, the 29th day of June, 1850.

H. L. BULWER.

27.—*Memorandum touching Sir Henry Bulwer's declaration filed by Mr. Clayton in the Department of State at Washington, July* 5, 1850.

The within declaration of Sir H. L. Bulwer was received by me on the 29th day of June, 1850. In reply I wrote him my note of the 4th of July, acknowledging that I understood British Honduras was not embraced in the treaty of the 19th day of April last, but at the same time carefully declining to affirm or deny the British title in their settlement

or its alleged dependencies. After signing my note last night I delivered it to Sir Henry, and we immediately proceeded, without any further or other action, to exchange the ratifications of said treaty. [* The blank in the declaration was never filled up.] The consent of the Senate to the declaration was not required and the treaty was ratified as it stood when it was made.

JOHN M. CLAYTON.

N. B.—The rights of no central American state have been compromised by the treaty or by any part of the negotiations.

28.—*Charter granted by the State of Nicaragua to the Accessory Transit Company.*

The supreme government of the Republic of Nicaragua, fully authorized by legislative decree of the 13th instant, have agreed, by means of their commissioners, Don Fruto Chamorro and Don Mateo Mayorga, with the sole object of facilitating the construction of the maritime canal, and in accordance with the desires expressed by the company of the said canal, represented by Joseph L. White, esq., to divide and separate from the contract of the 22d of September, 1849, relating to the construction of the said canal through the Isthmus of Nicaragua, the part therein relating to the navigation by steam of the waters of Nicaragua, and to that effect they have agreed to the following convention:

ARTICLE I.

The Repubic of Nicaragua authorizes the American, Atlantic, and Pacific Ship-Canal Company to divide and separate from the powers, privileges, and rights granted by the treaty, signed by said government on the 22d September, 1849, and amended the 11th of April, 1850, all the powers, privileges, rights, and duties designated in the Articles 6, 14, 20, 21, 22, 23, 30, 32, 33, 34, and all other articles relating to the navigation of the waters of Nicaragua, not essential to the construction or use of the said ship-canal.

ARTICLE II.

Said company is equally authorized to form another company, distinct and separate, comprised of the same members as the former. This new company shall enjoy the powers and be subject to the duties inserted in the articles aforesaid, provided they are not in contradiction to the rights granted, and to the duties imposed upon the Ship-Canal Company.

ARTICLE III.

The company newly created shall proceed to execute and accomplish the objects of its incorporation, as set forth in the said articles above alluded to, and shall have a right to, and shall have the protection of the Government of Nicaragua, within the same limits and to the same

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* The words in brackets appear in the original in ink, but are marked out by lead-pencil marks across their face. When they were so marked is not known. The blanks in the original declaration are filled up with "29th" and "June," written with a different kind of ink from the original.

extent which have been stipulated in the primary charter of the 22d September, 1849, and its amendments of the 11th of April, 1850, relating to the construction of a ship-canal. All the acts and things which may constitute an infraction of the rights of the Ship-Canal Company, shall equally be considered an infraction of the rights of the company newly created in all that refers to the objects of its institutions.

ARTICLE IV.

The new company, when organized, shall be designated by the name of "The Accessory Transit Company." They shall be a body corporate and politic, with perpetual succession during the time of their legal existence, and they shall have full powers to use their rights and privileges and accomplish fully the duties designated in the present convention and in the aforesaid articles in such manner as may seem to them most convenient and proper, provided that it be not in contradiction to the privileges and duties inserted in the primary charter of the 22d of September, 1849, and amendments thereto of the 11th of April, 1850.

ARTICLE V.

Said company, forming a body corporate and politic, may elect and remove their officers and agents according as they may deem it for their interest; they shall have the faculty of passing and adopting such laws and regulations as they may consider conducive to the better administration of their affairs, in view of securing the enjoyment of their privileges, and for the entire fulfillment of their obligations.

They may fix the amount and value of stock to be issued, and increase the same if necessary; provide the mode of transferring the same, and do all acts and things which are proper and necessary to carry out strictly the purposes of their institution, and according to the above-mentioned articles.

ARTICLE VI.

The company, forming a body corporate and politic, shall elect a board of directors and a president, and shall fix the number of the members thereof, the majority of whom shall determine and adopt all resolutions necessary to carrying out the purposes expressed in the preceding articles, and such others as refer to the right of transit and are not inconsistent with the right of constructing and using the canal. The company may adopt a common seal, and change it if necessary. They may sue and be sued before the tribunals of the state as if they were a natural person.

ARTICLE VII.

All the property, choses in action, things, rights, credits, and effects of the new company shall be free from all charges and duties whatsoever during the existence of the grant, within the limits expressed in the primary charter of the 22d September, 1849, and amendments thereto of the 11th of April, 1850, conceded for the construction of a ship-canal, and for other purposes.

ARTICLE VIII.

This convention, and all the rights and privileges secured by it to the company and conferred by it, shall cease whenever the primary charter

of the 22d of September, 1849, shall expire by its own limitation, or shall be otherwise forfeited or annulled.

ARTICLE IX.

It is understood and agreed by and between the contracting parties that no expression used in this convention can be or shall be construed as relieving either party from the performance of all the obligations imposed upon them respectively by the charter of the 22d of September, 1849, and amendments thereto of the 11th of April, 1850.

Done and signed in duplicate in the city of Granada, of Nicaragua, the fourteenth day of August, one thousand eight hundred and fifty-one.

[SEAL.]

FRUTO CHAMORRO,
MATEO MAYORGA,
J. L. WHITE,
Counsel to and Representative of the American and Atlantic and Pacific Ship-Canal Company.

29.—*Mr. Lawrence to Mr. Webster.*

[Extract.]

164.] LEGATION OF THE UNITED STATES,
London, February 27, 1852. (Received March 13.)

SIR: * * * The report of Colonel Childs is looked for with deep interest, and there does not appear any difficulty in associating persons of both countries able to accomplish so great a work whenever a satisfactory survey shall have been completed.

I have, &c.,

ABBOTT LAWRENCE.

30.—*Mr. Lawrence to Mr. Webster.*

[Extract.]

168.] LEGATION OF THE UNITED STATES,
London, March 26, 1852. (Received April 9.)

SIR: Since my dispatch, No. 164, relative to the proposed survey for a route for a canal between the Atlantic and Pacific Oceans, I have heard nothing further from Messrs. Vanderbilt and White, nor have I received the report of Colonel Childs. * * *

As there can probably be but one canal, as that one should be constructed as well for the wants of the future as those of the present, and as it will doubtless absorb in its construction as much of the private capital of both countries as mercantile persons will desire to invest in it, I am anxious that a preliminary survey like the present should be made in such a way as to insure its completion and excite jealousy in neither country.

It is equally the interest of the United States and of Great Britain to connect the two oceans at the earliest practicable period by the best route, without reference to private interests, even though at an aug-

mented cost of a few millions of dollars. The canal will be remunerative at any rate. But it is understood that neither government will be interested in its construction beyond the guarantee of the treaty of 1850. Yet each may assist by its advice and encouragement. The present British cabinet, following the example of the last, is, I think, inclined to give to private individuals embarking in this scheme, the aid of its countenance. I respectfully suggest that the same course may be pursued at Washington with great benefit to the country by entering into communication with capitalists and others who might be disposed to aid in completing this most important work.

I have, &c.,

ABBOTT LAWRENCE.

31.—*Arrangement for settling Central American affairs agreed upon between Mr. Crampton and Mr. Webster.*

WASHINGTON, *April* 30, 1852.

The undersigned, Daniel Webster, Secretary of State of the United States, and John Fiennes Crampton, Envoy Extraordinary and Minister Plenipotentiary of her Britannic Majesty, having taken into consideration the state of the relations between the Republics of Costa Rica and Nicaragua in respect to the boundaries between those republics, and between the Republic of Nicaragua and the territory claimed by the Mosquito Indians; and being mutually desirous that all pending differences respecting those questions should be amicably, honorably, and definitely adjusted, do in behalf of their respective governments earnestly recommend to the respective governments of the Republics of Nicaragua and Costa Rica an accommodation and settlement of these differences upon the following basis:

ARTICLE I.

The Mosquito Indians may reserve to themselves out of the territory heretofore claimed or occupied by them on the eastern coast of Central America, a district of country, and the jurisdiction over the same to be bounded as follows, namely: beginning on the shore of the Caribbean Sea at the mouth of the river Rama, which is (according to Bailey's map of Central America, published in London in November, 1850) in 11° 34′ north latitude and 83° 46′ west longitude; running thence due west to the meridian 84° 30′ west longitude from Greenwich; thence due north on said meridian to the river Segovia, Fantasma, or Wanx; thence down said river to the Caribbean Sea; thence southerly along the shore of said sea to the place of beginning; and all the rest and remainder of the territory and lands lying southerly or westerly of said reservation heretofore occupied or claimed by the said Mosquitos, including Greytown, they shall relinquish and cede to the Republic of Nicaragua, together with all jurisdiction over the same in consideration of the net receipts for a period of three years from all duties levied and collected at Greytown at the rate of 10 per cent. ad valorem on all goods imported into the State.

The period of three years to commence on the day when Nicaragua shall formally take possession of and enter into the occupancy of said town. And the said net receipts shall be payable quarterly, or every

three months, to such agent or agents as may be appointed to receive them.

And the said Republic of Nicaragua hereby agrees not in any way to molest or interfere with the Mosquito Indians within the territory herein reserved by them.

It is also understood that any grants of land which may have been made by the said Mosquitos since the 1st of January, 1848, in that part of the Mosquito territory hereby ceded to Nicaragua, shall not be disturbed, provided the said grants shall not interfere with other legal grants made previously to that date by Spain, by the Central American Confederation, or by Nicaragua, or with the privileges or operations of the Atlantic Ship-Canal Company, or Accessory Transit Company, and shall not include territory desired by the Nicaraguan Government for forts, arsenals, or other public buildings.

II.

It is also understood that nothing in the preceding article shall preclude the conclusion of such voluntary compact and arrangements between the State of Nicaragua and the Mosquito Indians, by which the latter may be definitively incorporated and united with the State of Nicaragua, it being stipulated that in such case the said Mosquito Indians shall enjoy the same rights and be liable to the same duties as the other citizens of the said State of Nicaragua. The municipal and public authority in the town of Greytown shall be held and exercised by the Government of Nicaragua, but said government shall levy no duties of tonnage nor any duties of import on goods imported into Greytown, intended for transit across the isthmus or for consumption in any other state than that of Nicaragua, except such tonnage duty as may be necessary for the preservation of the port and harbor, and the erection and maintenance of necessary light-houses and beacons, and no duty for this or similar purposes shall exceed say 12 cents per ton on each vessel.

III.

The boundary between the Republics of Nicaragua and Costa Rica shall begin on the south bank of the Colorado at its confluence with the sea at high-water mark on said river; thence along said south bank, also at high-water mark, to the confluence of the Colorado with the river San Juan; thence, at high-water mark, along the south bank of the San Juan to its source on Lake Nicaragua; thence, at high-water mark, along the south and west shore of that lake to the point nearest the mouth of the river La Flor; thence by a direct line drawn from that point to the mouth of the said river in the Pacific Ocean. It is understood, however, that Costa Rica retains the right, in common with Nicaragua, to navigate said rivers and lake by said vessels, barges, or vessels towed, but not by steam; but this right is by no means to interfere with the paramount right in Nicaragua or her grantors to appropriate the waters of said rivers and lake for a ship-canal from ocean to ocean, or from the Caribbean Sea to said lake.

It is also understood that the said company entitled "The American Atlantic and Pacific Ship-Canal Company" shall have the privilege of locating on the south bank of the St. John River four of the eight stations or sections of land referred to in the XXVIIth article of the amended charter of said company, as ratified by the Government of Nicaragua on the 11th of April, 1850. If, however, the said company

should desire to locate more than the said four sections on the south side of the San Juan, the Governments of Nicaragua and Costa Rica will amicably agree in regard to the terms of such location.

IV.

Neither the Government of Nicaragua nor the Government of Costa Rica should be at liberty to erect, or suffer to be erected, any wharf, wall, embankment, or other structure, or to do, or suffer to be done, any thing or act whatever, in the harbor of Greytown, in any part of the Colorado or San Juan Rivers, or on the shore of Lake Nicaragua, which shall obstruct the free operations of the ship-canal or transit company, or hinder the passage of their boats in, along, and through the said harbor of Greytown and rivers Colorado or San Juan. And if, after the proper survey of a route for a ship-canal between the two oceans, it shall be found that it would be preferable for that canal to pass in part along the southern bank of the river San Juan or the Colorado River, the Government of Costa Rica engages to grant any lands and to afford any facilities which may be necessary for the construction of the said canal.

V.

Whereas it is stipulated by Article II, of the convention between Great Britain and the United States of America, concluded at Washington on the 19th day of April, 1850, that vessels of the United States or Great Britain traversing the said canal shall, in case of war between the contracting parties, be exempt from blockade, detention, or capture by either of the belligerents, and that that provision should extend to such a distance from the two ends of the said canal as might thereafter be found expedient to establish; now, for the purpose of establishing such distance within which the vessels of either of said nations shall be exempt from blockade, detention, or capture by either of the belligerents, it is hereby declared that it shall extend to all waters within the distance of twenty-five nautical miles from the termination of said canal on the Pacific and on the Atlantic coasts.

VI.

Whereas by Article VII of the said convention it was among other things stipulated that if any persons or company had already made with any state through which the ship-canal might pass, a contract for the construction of such a canal as that specified in said convention, to the stipulations of which neither of the contracting parties in that convention had any just cause to object; and the said persons or company had moreover made preparations and expended time, money, and trouble on the faith of such contract, it was thereby agreed that such persons or company should have a priority of claim over every other person or persons, or company, to the protection of the Governments of the United States and Great Britain, and should be allowed a year from the date of the exchange of ratifications of that convention for concluding their arrangements, and presenting evidence of sufficient capital subscribed to accomplish the contemplated undertaking; it being understood that if at the expiration of the aforesaid period, such persons or company should not be able to commence and carry out the proposed enterprise, then the Governments of the United States and Great Britain should be free to afford their protection to any other persons or

company that should be prepared to commence and proceed with the construction of the canal in question. And whereas at the time of the signature of the said convention, a company styled the American Atlantic and Pacific Ship-Canal Company had with the Government of the Republic of Nicaragua a contract for constructing a ship-canal between the said oceans, but, for reasons deemed sufficient by the Governments of Great Britain and the United States, have not hitherto been able to comply with the stipulation which gave them a claim to the protection of the said governments; and whereas no other company has claimed such protection on the same conditions, it is therefore agreed that the further time of one year from the exchange of the ratifications of this convention shall be allowed to the said company to comply with the stipulation aforesaid.

VII.

And whereas by another charter (of April 11, 1850) to the American Atlantic and Pacific Ship-Canal Company, the State of Nicaragua, with a view to facilitate the construction of the canal, has authorized the said company to separate from their said contract of September 22, 1849, the part relating to the navigation of the waters of Nicaragua by steam, under the title of the Accessory Transit Company; and whereas the said Accessory Transit Company has been for some time past in full and successful operation, the Governments of Great Britain and the United States hereby engage to extend their protection to the said Accessory Transit Company in the same manner and to the same extent as by the aforesaid convention of April 19, 1850, and by this convention the said protection is extended to the Atlantic and Pacific Ship-Canal Company; but as the main object of the said convention between Great Britain and the United States of America was to provide for an interoceanic ship-canal between the Atlantic and Pacific, and as that object is still deemed paramount to every other mode of transit, the protection hereby extended to the Accessory Transit Company shall not be construed to interfere with the right to construct said canal by the company which has undertaken to construct the same, or, in case of their failure, by any other persons or company which may be authorized to construct the same; and every grant and privilege conferred upon said Accessory Transit Company shall be subject to the paramount right and privilege of any other persons or company to construct, maintain, and use such canal.

Finally, these propositions, so far as they respect the Governments of Nicaragua and Costa Rica, are advisory and recommendatory; and the immediate consideration of those governments to their consideration is earnestly invoked.

To insure a prompt decision, Mr. Wyke, consul-general of Her Britannic Majesty, clothed with full powers for that purpose, Mr. Kerr, chargé d'affaires of the United States to Nicaragua, and Mr. Walsh, appointed special agent of the United States to the Government of Costa Rica, are authorized to communicate the arrangement proposed to those governments respectively; and, unless the aforesaid Governments of Nicaragua and Costa Rica shall promptly, and without loss of time, concur in the general basis of this arrangement, and adopt proper measures for carrying it into effect, then the Governments of Great Britain and the United States will immediately, as between themselves, jointly adopt such measures as they shall deem advisable to carry into full execution the convention between those governments of April 19, 1850; and to ac-

complish the design therein contemplated, of an interoceanic communication by canal from the Atlantic to the Pacific Ocean by the way of the river San Juan and the Lake Nicaragua.

JOHN F. CRAMPTON.
DANL. WEBSTER.

32.—*Mr. Webster to Mr. Lawrence.*

[Extract.]

No. 77.] DEPARTMENT OF STATE,
Washington, May 14, 1852.

SIR: Your dispatches, to No. 176, inclusive, have been received.

On the 30th ultimo, as you may have been informed through another channel, Mr. Crampton and myself agreed upon and signed a proposition to Costa Rica and Nicaragua for the adjustment of their disputes upon the subject of boundary, and also for the adjustment of the controversy between Great Britain and Nicaragua in regard to the territory claimed by the Mosquito Indians. If this proposition should be accepted by those republics, a quadripartite treaty will probably be entered into by them, Great Britain, and the United States. A principal impediment to the commencement or successful progress of the ship-canal through Nicaragua will then have been romoved.

Considering that the United States and Great Britain have jointly agreed to protect such a canal, and in consequence of their possessions on the coast of the Pacific, and other obvious causes, have a similar interest in its success, it seems desirable that the capital required for its construction should be advanced by the citizens and subjects of both countries. If, however, English capitalists should not be disposed to invest their funds in the enterprise, the means for its construction can easily be obtained in this country whenever our citizens shall be satisfied of its practicability, and that it would yield a regular and fair profit. Convinced of the great importance of the work, the Government of the United States would always be disposed to aid in the prosecution thereof to the full extent of its constitutional power. It is not likely, however, that the canal company will need any such assistance from this government.

The practicability of the canal may now be considered as certain. The survey under Colonel Childs, whose high professional and personal character are probably known to you, was some time since completed. He recently visited this city, bringing with him maps, plans, and estimates for the work. By direction of the President these were laid before Colonels Abert and Turnbull, of the United States Topographical Engineers, for examination and report. The report of these officers has confirmed the accuracy of the estimates of Colonel Childs. No doubt is entertained that they will receive a similar confirmation from any military or civil engineers in England to whom they may be submitted.

* * * * * * *

I am, &c.,

DAN'L WEBSTER.

33.—*Mr. Lawrence to Mr. Webster.*

No. 188.] LEGATION OF THE UNITED STATES,
London, June 8, 1852. (Received June 26.)

SIR: I have the honor to acknowledge the reception of your dispatch, No. 77, of 14th of May.

I rejoice to learn that Mr. Crampton and yourself have agreed upon and signed a proposition to Costa Rica and Nicaragua for the adjustment of their disputes upon the subject of boundary, and also for the adjustment of the controversy between Great Britain and Nicaragua in regard to the territory claimed by the Mosquito Indians. I hope Nicaragua will accept the proposition, of which, however, I entertain some doubt.

I am not acquainted with the terms of the proposition, nor, indeed, do I deem them of great importance, so that they guarantee perfect safety against aggressions upon the rights of the several parties interested, and prevent collisions between the United States and Great Britain.

With respect to the construction of the canal, I have often expressed my anxious desire that all questions touching the Mosquito Indians and the disputes between Nicaragua and Costa Rica should be definitively settled, in order that the canal company might be organized and the work commenced. In December last, Messrs. Vanderbilt and White wrote to me and to several other persons in London that the report of Colonel Childs would be completed and sent here in February of this year. The report, however, did not arrive, nor do I know the cause of its being delayed. Messrs. Fox, Henderson & Co., after waiting several weeks for it, concluded to send out a corps of engineers on their own account to survey a route between Port Escoces and the Gulf of San Miguel (and perhaps other routes) for a canal. It was proposed to send a British and United States engineer to report upon their surveys, and Lord Malmesbury appointed one on the part of the British Government, who was on the point of embarking for Washington, when, from some cause which his lordship said he would explain, it was decided not to send an engineer. I believe I have already communicated these facts to you. I hope the report of Colonel Childs may soon arrive, as the abundance of money is such as to make the present time favorable for the organization of a company and placing the stock in the hands of capitalists.

I have great confidence in the skill, judgment, and integrity of Colonel Childs; and the fact that Colonels Abert and Turnbull have verified his report will give confidence at home and abroad. I hope the report may be submitted to an examination here in order that a like feeling may be produced and strengthened in this government and people.

There is an understanding among those who have taken a deep interest in this work, that one-half of the stock should be offered to capitalists here, and the remainder to capitalists in the United States, and in case either party declined or did not subscribe for their full amount the other party should have a right to that portion remaining unsubscribed, or the whole if there were no subscriptions. The details, however, of organization must all be left to the proprietors.

I repeat the desire that Colonel Childs' report (and the colonel himself) may be here at an early day, and have, &c.

ABBOTT LAWRENCE.

34.—*Mr. Lawrence to Mr. Webster.*

[Extract.]

No. 194.] LEGATION OF THE UNITED STATES,
London, July 2, 1852. (Received July 16.)

SIR: * * * I have the honor to transmit also a copy of a note from the Earl of Malmesbury acquainting me with the appointment on the part of Her Majesty's Government of two engineers to examine the report of Colonel Childs respecting the ship canal which it is proposed to construct through the territory of Nicaragua from the Atlantic to the Pacific Ocean, together with a copy of my reply thereto. Lieutenant-Colonel Aldrich and Mr. James Walker, the gentlemen appointed to this service, are eminent in their profession, and any opinion emanating from them will be received by the public with the fullest confidence in their ability and integrity.

* * * * * * *

I have, &c.,

ABBOTT LAWRENCE.

Earl of Malmesbury to Mr. Lawrence.

The Earl of Malmesbury presents his compliments to Mr. Lawrence, and with reference to his letter of the 16th instant, inclosing Colonel Childs' report respecting the ship-canal which it is proposed to construct through the territory of Nicaragua, from the Atlantic to the Pacific Ocean, and suggesting the appointment of two competent engineers to examine that report, has the honor to inform Mr. Lawrence that Lieutenant-Colonel Aldrich, of the Royal Engineers, and Mr. James Walker, the eminent civil engineer, have been appointed by Her Majesty's Government to examine Colonel Childs' report.

Lord Malmesbury begs to add that he has requested the master general of the ordnance to direct Colonel Aldrich to place himself in immediate communication with Mr. Walker, and to proceed to the investigation with the least possible delay.

FOREIGN OFFICE, *June* 30, 1852.

Mr. Lawrence to Earl of Malmesbury.

Mr. Lawrence presents his compliments to the Earl of Malmesbury and begs to acknowledge the reception of his lordship's note of the 30th instant, acquainting Mr. Lawrence with the appointment of Lieutenant-Colonel Aldrich, of the Royal Engineers, and Mr. James Walker, the eminent civil engineer, to examine the report of Colonel Childs, respecting the ship-canal which it is proposed to construct through the territory of Nicaragua from the Atlantic to the Pacific Ocean.

Mr. Lawrence begs to assure the Earl of Malmesbury of his entire satisfaction at this intelligence, and to express his sense of his lordship's courtesy in expediting the investigation.

UNITED STATES LEGATION,
138 *Piccadilly, July* 2, 1852.

35.—*Proclamation of the organization of the British colony of the Bay Islands, July* 17, 1852.

PROCLAMATION.

OFFICE OF THE COLONIAL SECRETARY,
Belize, July 17, 1852.

This is to give notice that Her Most Gracious Majesty the Queen has been pleased to constitute and make the islands of Roatan, Bonacca,

Utilla, Barbarat, Helene, and Morat, to be a colony to be known and designated as "The Colony of the Bay Islands."

AUGUSTUS FREDERICK GORE,
Acting Colonial Secretary.

God save the Queen!

36.—*Mr. Lawrence to Mr. Webster.*

No. 198.] LEGATION OF THE UNITED STATES,
London, August 13, 1852. (Received August 27.)

SIR: I have the honor to inclose a further correspondence between Lord Malmesbury and myself relative to Colonel Childs' report upon the ship-canal between the Atlantic and Pacific Oceans by way of Lake Nicaragua. Lieutenant-Colonel Aldrich and Mr. Walker, the engineers appointed by Lord Malmesbury to examine the report made by Colonel Childs, have reported that the project in the line projected by Colonel Childs is practicable; that the survey made by him has every appearance of accuracy; that the works are generally sufficient for the purpose they are intended to answer; and that the estimates upon the present value of money are adequate. The British capitalists have the matter now under consideration. I have delayed sending you this correspondence, hoping to give you their decision with it.

I have, &c.,

ABBOTT LAWRENCE.

Lord Malmesbury to Mr. Lawrence.

Immediate.]

FOREIGN OFFICE, *July* 16, 1852.

SIR: In compliance with the suggestion contained in your letter of the 16th ultimo, that engineers possessing well-known skill and experience should be appointed on the part of Her Majesty's Government to examine the report of Colonel Childs on the ship-canal to be constructed through the Nicaraguan territory, from the Atlantic to the Pacific Ocean, that report having been already examined and approved by Colonels Abert and Turnbull, two distinguished officers of the Topographical Engineers of the United States, I have the honor to inform you that Lieutenant-Colonel Aldrich, of the Royal Engineers, and Mr. James Walker, an eminent civil engineer, were accordingly requested by me to perform that duty.

Those gentlemen readily assented to that request, and I have now the honor to transmit to you their report, accompanied by four inclosures upon the papers submitted to their inspection, being the documents which were inclosed in your letter of the 21st of June.

I have, &c.,

MALMESBURY.

Mr. Lawrence to Lord Malmesbury.

LEGATION OF THE UNITED STATES,
138 *Piccadilly, July* 17, 1852.

MY LORD: I have the honor to acknowledge the receipt of your lordship's letter of the 16th, inclosing the report of Lieutenant-Colonel Aldrich and Mr. James Walker upon Colonel Childs' report on the ship-canal to be constructed through the Nicaraguan territory, from the Atlantic to the Pacific Ocean, and I beg your lordship to accept my thanks for the great promptness with which you have complied with my request in this matter.

I have, &c.,

ABBOTT LAWRENCE.

[Extract.]

REPORT OF THE BRITISH ENGINEERS UPON THE REPORT OF COLONEL CHILDS.

From the foregoing premises and subject to our observations on particular works (especially as to Brito Harbour), *to which we beg to refer*, our opinion, with reference to the propositions contained in your letter to Mr. Walker, is—

1. That the project of a ship-canal from the Atlantic to the Pacific on a line projected by Colonel Childs is practicable, and would not be attended with engineering difficulties beyond what might be naturally expected in a work of this magnitude.

2. That the survey has every appearance of accuracy; that the details of specifications, working-drawings, &c., prepared under Colonel Childs' directions, by Mr. Fay, Mr. Fitzgerald, and others, have been got out with great care, and that Colonel Childs has impressed us with a conviction of perfect fairness and candor on his part.

3. That the works are generally sufficient for the purpose they are intended to answer.

4. That the estimates upon *the present value of money* are adequate, in a general way, so far as judgment can be formed of them from the documents produced and the explanations of Colonel Childs, which, as will be seen from his evidence, were particular and given in great detail.

We shall perhaps be considered as interpreting the word "*sufficiency*" in your instructions in a liberal sense, when we add, that to make the navigation 20 feet deep in place of 17 feet, and the locks 300 feet long in place of 250, and the canal 60 feet in place of 50 feet wide,* would, in our opinion, be rendering the navigation more efficient for the general purposes of trade by steam and sailing vessels. Colonel Childs (see his answers to questions 223 and 224) does not see any difficulty in doing this, excepting the expense, which would, we think, be unimportant when compared with the advantages.

The great additional expense would be in the deep cutting west of the lake, two or three miles of which might be left of the smaller width, if present saving be a great object. We find that the original instructions to Colonel Childs† directed the estimates and surveys to be made for a canal of sufficientdepth of water for vessels of the largest class; and if the junction of the Pacific with the Atlantic be worth doing at all, it is worth doing *well*.

JAMES WALKER,
Civil Engineer.
EDWARD ALDRICH,
Captain and Lieutenant-Colonel, Commander Royal Engineers, London District.

LONDON, *July* 16, 1852.

37.—*Mr. Marcy to Mr. Borland.*

[Extract.]

No. 8.] DEPARTMENT OF STATE,
Washington, December 30, 1853.

SIR: Your several dispatches, to No. 11, inclusive, have been received at this Department.

In relation to the Clayton and Bulwer treaty, about which so much is said in your dispatches, I have only to remark that this government considers it a subsisting contract, and feels bound to observe its stipulations so far as by fair construction they impose obligations upon it.

If Great Britain has failed, or shall fail, on her part to fulfill the obligations she has therein assumed, or if she attempts to evade them by a misconstruction of that instrument, the discussions that may arise on these subjects must necessarily take place between the parties to it. The views taken of that treaty by the United States, and your course in relation to it, pointed out in your first instructions, will be observed

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*The remark may apply more particularly to the trade with Britain, for which vessels upwards of 300 feet in length are now building or proposed.

†See page 4, Colonel Childs' report.

until you receive notice of their modification. In these instructions you were furnished with the views of one of the contracting parties (Great Britain), but at the same time you were informed that the United States did not concur in them. In the negotiations at London, in regard to the affairs of Central America, the meaning of that instrument will come directly under discussion. So far as respects your mission, you will regard it as meaning what the American negotiator intended when he entered into it, and what the Senate must have understood it to mean when it was ratified, viz, that by it Great Britain came under engagements to the United States to recede from her asserted protectorate of the Mosquito Indians, and to cease to exercise dominion or control in any part of Central America. If she had any colonial possessions therein at the date of the treaty, she was bound to abandon them, and equally bound to abstain from colonial acquisitions in that region. In your official intercourse with the states of Central America, you will present this construction of the treaty as the one given to it by your government.

It is believed that Great Britain has a qualified right over a tract of country called the Belize, from which she is not ousted by this treaty, because no part of that tract, when restricted to its proper limits, is within the boundaries of Central America.

* * * * * * *

I am, &c.,

W. L. MARCY.

38.—*Statement of Mr. Buchanan for Lord Clarendon.*

[Extract.]

LEGATION OF THE UNITED STATES,
London, January 6, 1854.

Mr. Monroe, one of our wisest and most discreet Presidents, announced in a public message to Congress in December, 1823, that "the American continents, by the free and independent condition which they have assumed and maintained, are henceforth not to be considered subjects for future colonization by any European powers." This declaration has since been known throughout the world as the "Monroe doctrine," and has received the public and official sanction of subsequent Presidents, as well as of a large majority of the American people. Whilst this doctrine will be maintained whenever, in the opinion of Congress, the peace and safety of the United States shall render this necessary, yet to have acted upon it in Central Amirica might have brought us into collision with Great Britain, an event always to be deprecated, and, if possible, avoided. We can do each other the most good, and the most harm, of any two nations in the world, and, therefore, it is our strong mutual interest as it ought to be our strong mutual desire, to remain the best friends. To settle these dangerous questions, both parties wisely resorted to friendly negotiations, which resulted in the convention of April, 1850. May this prove to be instrumental in finally adjusting all questions of difficulty between the parties in Central America, and in perpetuating their peace and friendship.

Surely the Mosquito Indians ought not to prove an obstacle to so appy a consummation.

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JAMES BUCHANAN.

39.—*Statement of Lord Clarendon for Mr. Buchanan.*

[Extract.]

FOREIGN OFFICE, *May* 2, 1854.

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It was never in the contemplation of Her Majesty's Government, nor in that of the Government of the United States, that the treaty of 1850 should interfere in any way with Her Majesty's settlement at Belize or its dependencies. It was not necessary that this should have been particularly stated, inasmuch as it is generally considered that the term "Central America"—a term of modern invention—could only appropriately apply to those states at one time united under the name of the "Central American Republics," and now existing as five separate republics; but, in order that there should be no possible misconception at any future period relative to this point, the two negotiators at the time of ratifying the treaty exchanged declarations to the effect that neither of the governments they represented had meant in such treaty to comprehend the settlement and dependencies in question.

Mr. Clayton's declaration to Her Majesty's Government on this subject was ample and satisfactory, as the following extract from his note of July 4, 1850, will show:

> The language of the first article of the convention concluded on the 19th day of April last, between the United States and Great Britain, describing the country not to be occupied, &c., by either of the parties, was, as you know, twice approved by the government, and it was neither understood by them nor by either of us [the negotiators] to include the British settlement in Honduras (commonly called British Honduras, as distinct from the state of Honduras) nor the small islands in the neighborhood of that settlement which may be known as its dependencies.
>
> To this settlement and these islands the treaty we negotiated was not intended by either of us to apply. The title to them it is now and has been my intention throughout the whole negotiation to leave as the treaty leaves it, without denying or affirming or in any way meddling with the same, just as it stood previously.
>
> The chairman of the Committee on Foreign Relations of the Senate, the Hon. W. N. King, informs me that the Senate perfectly understood that the treaty did not include British Honduras.

Such having been the mutual understanding as to the exception of the settlement of Belize and its dependencies from the operation of the treaty, the only question relative to this settlement and its dependencies in reference to the treaty that can now arise is as to what is the settlement of Belize and its dependencies, or, in other words, as to what is British Honduras and its dependencies.

Her Majesty's Government certainly understood that the settlement of Belize as here alluded to is the settlement of Belize as established in 1850; and it is more warranted in this conclusion from the fact that the United States had, in 1847, sent a consul to this settlement, which consul had received his exequatur from the British Government—a circumstance which constitutes a recognition by the United States Government of the settlement of British Honduras under Her Majesty as it then existed.

Her Majesty's Government at once states this, because it perceives that Mr. Buchanan restricts the said settlement within the boundaries to which it was confined by the treaty of 1786, whilst Her Majesty's Government not only has to repeat that the treaties with old Spain cannot be held, as a matter of course, to be binding with respect to all the various detached portions of the old Spanish-American monarchy,

but it has also to observe that the treaty of 1786 was put an end to by a subsequent state of war between Great Britain and Spain; that during that war the boundaries of the British settlement in question were enlarged; and that when peace was re-established between Great Britain and Spain no treaty of a political nature, or relating to territorial limits, revived those treaties between Great Britain and Spain which had previously existed.

Her Majesty's Government, in stating this fact, declares distinctly, at the same time, that it has no projects of political ambition or aggrandizement with respect to the settlement referred to; and that it will be its object to come to some prompt, fair, and amicable arrangement with the states in the vicinity of British Honduras for regulating the limits which should be given to it, and which shall not henceforth be extended beyond the boundaries now assigned to them.

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CLARENDON.

40.—*Remarks by Mr. Buchanan in reply to Lord Clarendon's statement of May 2.*

[Extract.]

LEGATION OF THE UNITED STATES,
London, July 22, 1854.

* * * * * * *

In regard to Belize proper, confined within its legitimate boundaries, under the treaties of 1783 and 1786, and limited to the usufruct specified in these treaties, it is necessary to say but a few words. The Government of the United States will not, for the present, insist upon the withdrawal of Great Britain from this settlement, provided all the other questions between the two governments concerning Central America can be amicably adjusted. It has been influenced to pursue this course partly by the declaration of Mr. Clayton, of the 4th of July, 1850, but mainly in consequence of the extension of the license granted by Mexico to Great Britain under the treaty of 1826, which that republic has yet taken no steps to terminate.

It is, however, distinctly to be understood that the Government of the United States acknowledge no claim of Great Britain within Belize except the temporary "liberty of making use of the wood of the different kinds, the fruits, and other produce in their natural state," fully recognizing that the former "Spanish sovereignty over the country" belongs either to Guatemala or to Mexico.

In conclusion, the Government of the United States most cordially and earnestly unites in the desire expressed by "Her Majesty's Government, not only to maintain the convention of 1850 intact, but to consolidate and strengthen it by strengthening and consolidating the friendly relations which it was calculated to cement and perpetuate." Under these mutual feelings it is deeply to be regretted that the two governments entertain opinions so widely different in regard to its true effect and meaning.

JAMES BUCHANAN.

41.—*Decree of the President of Nicaragua annulling the grant to the American Atlantic and Pacific Ship-Canal Company.*

Whereas the Republic of Nicaragua, on the 22d day of September, 1849 (one thousand eight hundred and forty-nine), granted to the American Atlantic and Pacific Canal Company certain rights and privileges, were subsequently modified by decree of the 11 day of April, 1850 (one thousand eight hundred and fifty), and whereas, in consideration of said rights and privileges, said company agreed to construct a ship-canal across the territory of said republic from the port of San Juan de Nicaragua to the port of Realejo, Gulf of Fonseca, Tamarinda, San Juan del Sud, or any of the points on the Pacific Ocean which the engineers of the company might decide upon, or in case that the construction and completion of said canal or any point of it should become impossible, by any unforeseen event or insurmountable obstacle of nature, to construct a railroad or rail & carriage road and water communication between the two oceans; and

Whereas the said American Atlantic and Pacific Ship-Canal Company have not constructed the said canal or commenced the same, but, on the contrary, has abandoned the undertaking and declared it impracticable, and have also failed to construct a railroad or rail and carriage road, as they agreed to do; and

Whereas the said American Atlantic and Pacific Ship-Canal Company was bound by the terms of said charter to pay the Republic of Nicaragua ten thousand dollars annually, and ten per cent. on the net profits of any route the company might establish between the two oceans during the time allotted for the completion of the canal and in furtherance thereof; and

Whereas the said American Atlantic and Pacific Canal Company have failed to pay annually said ten thousand dollars, together with the said ten per cent. net profits, falsely and fraudulently alleging that no profits were made and commission due; and

Whereas, by the said charter, it was stipulated that, for the purpose of settling all matters in dispute between the state and the company, commissioners should be appointed by the state on the one part and the company on the other; and

Whereas, on the 12th day of September, 1855 (one thousand eight hundred and fifty-five), the Republic of Nicaragua notified the said company to appoint commissioners under the charter, and the said company expressly refused the same; and

Whereas, by decree of the 9th day of March, 1850 (one thousand eight hundred and fifty), the said company was made a body politic and corporate, with perpetual succession, by the name and description of "The American Atlantic and Pacific Ship-Canal Company"; and

Whereas, on the 14th day of August, 1851 (one thousand eight hundred and fifty-one), the Republic of Nicaragua, with the sole object of facilitating the maritime canal, and in accordance with the desires expressed by the company of said canal to divide and separate from the contract of 22d September, 1849 (one thousand eight hundred and forty-nine), the part therein relating to the navigation by steam of the waters of Nicaragua, did constitute a new company, designated by the name of "Accessory Transit Company," and consisting of the same persons comprising the American Atlantic and Pacific Ship-Canal Company, and subject to the same obligations: Now, therefore,

The supreme provisional Government of Nicaragua, in virtue of the faculties,

DECREES:

1. The grant to the American Atlantic and Pacific Canal Company, of date 22d September, 1849 (one thousand eight hundred and forty-nine), and the modifications thereof, made 11th day of April, 1850 (one thousand eight hundred and fifty), and all the privileges therein contained, are *revoked* and *annulled;* the acts of incorporation of said company, of date 9th day of March, 1850 (one thousand eight hundred and fifty), and of the "Accessory Transit Company," of date 14 day of August, 1851 (one thousand eight hundred and fifty-one), *are annulled*, and the said American Atlantic and Pacific Ship-Canal Company and Accessory Transit Company *are dissolved and abolished*, except for the purposes hereinafter mentioned.

2. Señor Don Cleto Mayorga, Señor Don Eduardo I. C. Kewen, and Señor Don George F. Alden (any two of whom may act) are hereby appointed a board of commissioners, with full powers to *examine*, *liquidate*, and *ascertain* the amount due by the said American Atlantic and Pacific Canal Company and Accessory Transit Company to the state, with full powers to send for persons and papers, and to enforce respect and obedience to all their orders and decrees.

3. The said board shall proceed at once to discharge these duties, and for this purpose shall notify the agent of the companies residing in Nicaragua to appear before them forthwith, to give all evidence that may be required of them, and with the privilege to defend the interest of their principals.

4. The said companies shall be considered still in existence for the purpose of conducting this examination, and for the purpose of being held collectively responsible for such sum as may be ascertained to be due to the state, but for no other.

5. For the purpose of securing the payment of such amount the said board find due, they are hereby commanded to cause all the property of said companies to be seized forthwith and held by responsible persons, subject to the order of said board.

6. That the transit of passengers across this isthmus may suffer no interruption the board are authorized to deliver to such responsible persons as may make application all the said property so seized upon their executing a bond in a sum one-fourth greater than its appraised value, and with the conditions that the same shall be forthcoming when called for by the said board, and that the undertakers in the bond shall continue to transport the passengers who may arrive on the side of the Atlantic & Pacific Oceans, and the expenses of transporting said passengers shall be charged against the said companies.

7. Before allowing the said property to be bonded the board shall cause the same to be fairly approved by three competent persons appointed for the purpose.

8. The board shall proceed summarily and with dispatch, and on determining the amount due from the companies to the state shall report their proceedings immediately to the government.

9. The compensation of the board of commissioners, as well as of the board of appraisers, by them appointed, will be hereafter determined.

10. Let this be communicated to the proper authorities.

Given at Granada the 18th day of February, 1856.

PATRICIO RIVAS.

42.—*Additional article to the treaty of friendship, commerce, and navigation between Great Britain and Honduras, signed at London, August* 27, 1856.

Inasmuch as a contract was entered into by the Government of Honduras, and a company entitled "The Honduras Interoceanic Railway Company," for the construction of a railway from the Atlantic to the Pacific Oceans through the territories of Honduras, which contract was ratified by the constitutional powers of the state, and proclaimed as a law on the 28th day of April, 1854; and inasmuch as by the terms of Article V, section 6, of the said contract, "the Government of Honduras, with a view to secure the route herein contemplated from all interruption and disturbance, from any cause or under any circumstances, engages to open negotiations with the various governments with which it may have relations, for their separate recognition of the perpetual neutrality, and for the protection of the aforesaid route:" Therefore, in order to carry out the obligation thus incurred,

1. The Government of Honduras agrees that the right of way or transit over such route or road, or any other that may be constructed through its territories, from sea to sea, shall be at all times open and free to the Government and subjects of Great Britain, for all lawful purposes whatever. No tolls, duties, or charges of any kind shall be imposed by the Government of Honduras on the transit of property belonging to the Government of Great Britain, or on the public mails sent under the authority of the same, nor on the subjects of the British Crown. All lawful produce, manufuctures, merchandise, or other property belonging to subjects of Great Britain, passing from one ocean to the other, in either direction, shall be subject to no import or export duties whatever, nor to any discriminating tolls or charges for conveyance or transit on any such route or road as aforesaid, and shall be secure and protected from all interruption and detention on the part of the state.

The Republic of Honduras further agrees that any other privilege or advantage, commercial or other, which is or may be granted to the subjects or citizens of any other country in regard to any such route or road as aforesaid, shall be also and at the same time extended to British subjects; and, finally, as an evidence of its disposition to accord to the travel and commerce of the world all the advantages resulting from its position in regard to the two great oceans, the Republic of Honduras, of her own good will, engages to establish the ports at the extremities of the contemplated road as free ports for all the purposes of commerce and trade.

2. In consideration of these concessions, and in order to secure the construction and permanence of the route or road herein contemplated, and also to secure for the benefit of mankind the uninterrupted advantages of such communication from sea to sea, Her Britannic Majesty recognizes the rights of sovereignty and property of Honduras in and over the line of the said road, and for the same reason guarantees, positively and efficaciously, the entire neutrality of the same so long as Great Britain shall enjoy the privileges conceded to it in the preceding section of this article. And when the proposed road shall have been completed Her Britannic Majesty equally engages, in conjunction with the Republic of Honduras, to protect the same from interruption, seizure, or unjust confiscation from whatsoever quarter the attempt may proceed.

Nevertheless, Her Britannic Majesty, in according her protection to the said route or road, and guaranteeing its neutrality and security

when completed, always understands that this protection and guarantee are granted conditionally, and may be withdrawn by her if she should deem that the persons or company undertaking or managing the same adopt or establish such regulations concerning the traffic thereupon as are contrary to the spirit and intention of this article, either by making unfair discriminations in favor of the commerce of any nation or nations over the commerce of any other nation or nations, or by imposing oppressive exactions or unreasonable tolls upon passengers, vessels, goods, wares, merchandize, or other articles.

The aforesaid protection and guarantee shall not, however, be withdrawn by Her Britannic Majesty without first giving six months' notice to the Republic of Honduras.

The present additional article shall have the same force and validity as if it were inserted word for word in the treaty of friendship, commerce, and navigation signed this day. It shall be ratified, and the ratifications shall be exchanged at the same time; and its stipulations shall, subject to the same condition of notice on the part of Her Britannic Majesty, provided for in the preceding paragraph of this article, be permanent between the contracting parties.

In witness whereof the respective plenipotentiaries have signed the same and have affixed thereto their respective seals.

Done at London the 27th day of August, in the year of our Lord 1856.

[L. S.] CLARENDON.
[L. S.] VR. HERRAN.

43.—*Lord Napier to Lord Clarendon.*

No. 5.] WASHINGTON, *March* 12, 1857. (Received March 29.)

MY LORD: I had this afternoon an interview with General Cass, when I requested that he would communicate to me the views taken in the Senate with reference to the Central American treaty, as far as was consistent with the secrecy of the pending deliberation.

The Secretary of State replied that the subject was at that very hour under discussion, and that opinions were divided in the following manner: Some held that the treaty should be sanctioned in its original form, others that it should be accepted with certain modifications, while a third party advocated its rejection, but proposed to temper this course by the adoption of certain resolutions embodying sentiments of a friendly disposition towards Great Britain, and approving a settlement of the Central American question in conformity with the spirit of the treaty agreed to by your lordship and Mr. Dallas. General Cass appeared to anticipate that the last alternative would prevail.

I remarked that I was not surprised by the result which he predicted, for impressions of a similar character had been imparted to me at New York; but I added that Her Majesty's Government would certainly learn with concern that all the efforts of Mr. Dallas, aided by your lordship's generous co-operation, had not succeeded in framing an arrangement acceptable to the Senate; such an issue had not been anticipated by the United States minister, and your lordship's expectations of the success of the treaty had been confirmed by the intelligence derived from Mr. Dallas that he (General Cass) had given the measure his support in the first instance.

The Secretary of State explained that at an early period a general outline of the projected arrangement had reached him, and had certainly

obtained his warm approval, but that when he came to know the details more accurately he recognized in them principles of foreign intervention repugnant to the policy of the United States. The treaty engaged the Government of the United States to combine with that of Great Britain in urging a certain course of conduct on a foreign state. This could not be allowed; it was not consistent with the common practice of his country. The object, indeed, was good, and he hoped it might be attained in another shape, It might be prosecuted by a direct and distinct negotiation between Great Britain and Nicaragua, in which Her Majesty's Government would, if necessary, have the good offices of the President.

General Cass then passed some reflections on the Clayton-Bulwer treaty; he had voted for it, and in doing so he believed that it abrogated all intervention on the part of England in the Central American territory. The British Government had put a different construction on the treaty, and he regretted the vote he had given in its favor. He did not, however, pretend that the British Government should now unconditionally abandon the Mosquitos with whom they had relations of an ancient date; it was just and consistent with the practice of the United States that those Indians should be secured in the separate possession of lands, the sale of which should be prohibited, and in the enjoyment of rights and franchises, though in a condition of dependency and protection. The British Government had already removed one impediment to the execution of the Bulwer-Clayton treaty by the cession of their claims on Ruatan; two difficulties now remained, the frontier of Belize and the delimitation and settlement of the Mosquito tribe. If the frontier could be defined, and if the Mosquitos could be placed in the enjoyment of their territory by treaty between Great Britain and Nicaragua, in which the concessions and guarantees of the latter in favor of the Indians should be associated with the recognition of the sovereignty of Nicaragua—so I understood the general—then the Bulwer-Clayton treaty might be a permanent and satisfactory settlement between the contracting parties. The United States desired nothing else but an absolute and entire neutrality and independence of the Central American region, free from the exercise of any exclusive influence or ascendency whatever.

The Secretary of State terminated a rather desultory conversation on these matters by stating that his present remarks were to be regarded as of a merely general and speculative nature. The Senate had not yet pronounced; as soon as the decision was known and the resolutions taken they should be transmitted to your lordship through Mr. Dallas, and communicated to myself.

General Cass, before I took my leave, offered me an emphatic assurance of good will to the Government of Great Britain, and expressed the satisfaction which he hoped to find in his correspondence with Her Majesty's mission.

I have, &c.,

NAPIER.

The Earl of Clarendon.

44.—*Lord Napier to Lord Clarendon.*

[Extract.]

No. 14.] WASHINGTON, *May* 6, 1857. (Received May 25.)

On receiving your lordship's dispatch of the 17th ultimo on the 2d instant, informing me that Her Majesty's Government had not found it expedient to ratify the Central American treaty in its altered shape, and instructing me to propose the conclusion of a new treaty embodying all the resolutions of the United States Senate, with the single addition framed as a safeguard for British interests in the Bay Islands, I determined not to carry your lordship's orders into execution without previously soliciting an interview with the President. His excellency did me the honor to appoint an early day for this purpose, but an attack of illness prevented me from availing myself of his goodness, and it was not until this afternoon that I was enabled to pay my respects to his excellency.

I found the President fully informed of the grounds on which Her Majesty's Government had based their resolution, and of their desire to enter into new engagements, but I think he entertained an impression that the reason alleged by Her Majesty's Government did not really express the whole or the most cogent motive of their objections, and he was not apprised of the terms of the simple qualification which Her Majesty's Government propose to add to the treaty as modified by the Senate.

I placed your lordship's instructions in the hands of the President. He assured me that he was now quite convinced that the non-ratification of the Honduras treaty formed the true and only motive for the rejection of that negotiated by your lordship with Mr. Dallas; that he could hardly understand the importance attached to this point by Her Majesty's Government; that he deeply regretted their determination, and that it was the last ground on which he had anticipated any reluctance.

The President thought Her Majesty's Government had acted unwisely in neglecting this opportunity to close the Central American discussions and place the relations of the two countries on a satisfactory basis at a moment when the public feeling was so friendly on either side of the Atlantic.

After reading the article proposed by Her Majesty's Government he told me, not without some appearance of regret, that unless he changed his opinion, of which he saw little prospect, he could not assent to a stipulation which would involve the recognition by his government of a treaty between Great Britain and Honduras relative to the Bay Islands, and if he did accept such a stipulation it would infallibly be rejected by the Senate.

I argued that whatever there was repugnant to the feelings of the Senate in reference to slavery, or whatever there was unacceptable in regard to trade or government in the treaty of August 27, 1856, might be subjected to some change, and I offered to bring his views on this subject under your lordship's notice, but his excellency held out no hope; his objection pointed to the recognition of any treaty at all!—to the bare allusion to it. Great Britain and Honduras might frame any settlement they pleased for the future government of the islands; it was their business, not that of the United States. The United States could not take cognizance of those arrangements in any degree, however remote and indirect.

Finding the President quite firm in this position, I shifted the discus-

sion to the relations of the two countries in case of the official rejection of your lordship's present proposal, remarking that we should fall back on the Clayton-Bulwer treaty, a basis which, if not fixed by arbitration or in some other way, would break up under our feet.

The President denounced the Clayton-Bulwer treaty as one which had been fraught with misunderstanding and mischief from the beginning; it was concluded under the most opposite constructions by the contracting parties. If the Senate had imagined that it could obtain the interpretation placed upon it by Great Britain, it would not have passed. If he had been in the Senate at the time, that treaty never would have been sanctioned. With reference to arbitration (which I had only thrown in as a suggestion of my own), he observed that he could not give any opinion at present. The President also inveighed against the success of treaties, affirming that they were more frequently the cause of quarrel than of harmony, and that, if it were not for the interoceanic communications, he did not see there was any necessity for a treaty respecting Central America at all.

NAPIER.

The EARL OF CLARENDON.

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45 —General Cass to Lord Napier.

WASHINGTON, *May* 29, 1857.

MY LORD: I have received your lordship's note of the 6th instant, communicating the resolution of the British Government to advise the Queen not to ratify the treaty of the 17th October, 1856, respecting the affairs of Central America, and which had been modified by the Senate of the United States, and in its modified form submitted for the consideration and action of your government. I have laid before the President this note, together with the accompanying projet of a new treaty, and I have received his instructions to make known to you his views upon the subject.

The Clayton-Bulwer treaty, concluded in the hope that it would put an end to the differences which had arisen between the United States and Great Britain concerning Central American affairs, had been rendered inoperative in some of its most essential provisions by the different constructions which had been reciprocally given to it by the parties; and little is hazarded in saying that had the interpretation since put upon the treaty by the British Government, and yet maintained, been anticipated it would not have been negotiated under the instructions of any Executive of the United States nor ratified by the branch of the government intrusted with the power of ratification.

A protracted discussion, in which the subject was exhausted, failed to reconcile the conflicting views of the parties; and as a last resort a negotiation was opened for the purpose of forming a supplementary treaty which should remove, if practicable, the difficulties in the way of their mutual good understanding, and leave unnecessary any further discussion of the controverted provisions of the Clayton-Bulwer treaty. It was to effect this object that the Government of the United States agreed to open the negotiations which terminated in the treaty of October 17th, 1856, and though the provisions of that instrument, even with the amendments proposed by the Senate, were not wholly unobjectionable either to that body or to the President, still, so important

did they consider a satisfactory arrangement of this complicated subject that they yielded their objections and sanctioned, by their act of ratification, the convention as amended. It was then transmitted to London for the consideration of Her Britannic Majesty's Government, and having failed to meet its approbation has been returned unratified. The parties are thus thrown back upon the Clayton-Bulwer treaty, with its disputed phraseology and its conflicting interpretations; and, after the lapse of seven years, not one of the objects connected with the political condition of Central America, which the United States had hoped to obtain by the arrangement, has been accomplished.

Under these circumstances your lordship informs me that the British Government, appreciating the differences which this subject has caused "between the two countries," have determined to propose to the United States the conclusion of a new treaty, and in conformity with your instructions this proposition is accompanied with the *projet* of a convention which, if ratified by the President and Senate of the United States, it is engaged will be ratified by Her Britannic Majesty.

The draft presented is identical in its language with the treaty of October, as ratified by the Senate, except that to that clause of the second separate article which provides for the recognition of the Bay Islands "as under the sovereignty and as part of the Republic of Honduras" there is added the provision:

> Whenever and so soon as the Republic of Honduras shall have concluded and ratified a treaty with Great Britain by which Great Britain shall have ceded, and the Republic of Honduras shall have accepted, the said islands, subject to the provisions and conditions contained in the said treaty.

This provision is a substitute for the provision relating to the same subject contained in the rejected treaty, and which referred to a subsisting convention with Honduras for the cession to that republic of the Bay Islands. Taken in connection with this convention, of which your lordship was good enough on the 10th instant to communicate a copy to this department, upon my application, that provision, whilst declaring the Bay Islands to be "a free territory under the sovereignty of the Republic of Honduras," deprived that country of rights without which its sovereignty over them could scarcely be said to exist. It separated them from the remainder of Honduras, and gave them a government of their own, with their own legislative, executive, and judicial officers, elected by themselves. It deprived the government of Honduras of the taxing power in every form, and exempted the people of the Bay Islands from the performance of military duty, except for their own defense, and it prohibited the republic from providing for the protection of these islands by the construction of any fortifications whatsoever, leaving them open to invasion from any quarter. Had Honduras ratified this treaty, she would have ratified the establishment of an "independent" state within her own limits, and a state at all times liable to foreign influence and control. I am not, therefore, surprised to learn from your lordship that "Her Majesty's Government do not expect that this treaty, in its present shape, will be definitively sanctioned by that republic."

But, while this expectation may be justified by the event, it is certain that the new provision, like the former one, contemplates the cession of the Bay Islands to Honduras, only upon certain "conditions," and that these conditions are to be sanctioned by this government. The proposition, therefore, though changed in form, is the same in substance with that which was recently rejected by the Senate of the United States, and a just respect for the Senate would prevent the President from now consenting to its insertion in a new treaty. The action of that body,

moreover, met his cordial approbation, because it is his firm conviction that the Bay Islands are a part of the territory of Honduras, and justly subject to its government and to no other authority. Entertaining this opinion, it would be impossible for him to sanction any arrangement by which their restoration may be made dependent upon conditions either already prescribed or left to be prescribed hereafter. The case of these islands, as your lordship is aware, stands out in bold relief from all the other subjects embraced in the Clayton-Bulwer treaty. That instrument provided that neither of the parties should "colonize" any portion of Central America; and yet more than a year after its ratification, the colony of the Bay Islands was established by an act of the British Government. The United States have always considered that proceeding a violation of the treaty, even with the British construction of it; and the claim for its justification that the Bay Islands are dependencies of the Belize settlement cannot, it is believed, be maintained with success upon either American or British authority. It is directly at variance with the description given by Sir Charles Grey, the secretary of state for the colonies, in 1836, of the boundaries of the Belize settlement; and, from the discussions between the two governments which took place in London in 1854, it cannot be doubted that it was opposed also to the deliberate opinion of Lord Aberdeen, then at the head of the British cabinet.

Independently, however, of these considerations, there is another view of the subject which interposes insuperable obstacles to the desired action of the United States upon this treaty. The character or the extent of the concessions which England may demand of Honduras is nowhere defined in that instrument. Any grant, however inconsistent with the independence or the rights of that republic, if not inconsistent with the expresss provisions of the treaty, may be demanded by Great Britain, and, if rejected, what then will be the condition of the parties? Great Britain would retain the possession of these islands, with the implied concurrence of the United States, and this valuable group, overlooking one of the great avenues of communication of the world, and in the freedom and security of which the United States have a far deeper interest than any other nation, might thus eventually become a permanent portion of the British Empire. That the United States should decline to make themselves a party to such an arrangement can surely occasion neither surprise nor disappointment to the people or statesmen of Great Britain.

I am, therefore, directed by the President to announce to your lordship that he cannot accept the *projet* of a treaty which, agreeably to your instructions, you have presented for his consideration. But, while feeling it his duty so to decide, he fully reciprocates the desire of your government to cement the amicable relations of the two countries, and, during his administration, no effort shall be wanting on his part to prevent any interruption of that friendly intercourse which both Great Britain and the United States have so many powerful motives to promote.

I have, &c.,

LEWIS CASS.

46.—*Lord Napier to Lord Clarendon.*

[Extract.]

No. 19.] WASHINGTON, *June* 22, 1857. (Received July 7.)

It is probable that if the pending discussions regarding Central America be not closed during the present summer, an attempt will be made in the next session of Congress to set aside the Clayton-Bulwer treaty. My impression to this effect is constantly deepened by reflection and by the information which reaches me from several quarters.

There can be no doubt of the views of the President and Cabinet in this matter.

NAPIER.

The EARL OF CLARENDON.

47.—*Lord Napier to Lord Clarendon.*

[Extract.]

WASHINGTON, *October* 12, 1857. (Received October 30.)

MY LORD: I am now assured that the American Cabinet will shortly receive Mr. Yrissari in the quality of minister from Nicaragua, and that a treaty will be negotiated with him for the protection of the interoceanic passage by the River San Juan, similar to that contracted between Great Britain and Honduras for the guarantee of the railway projected across the territory of the latter state.

At the same time the Government of Nicaragua have recognized the existence of the old "American Atlantic and Pacific Ship Canal Company," which appeared to have lapsed during the operations of the "Accessory Transit Company," of filibustering notoriety. The original charter of the former association has been modified under the deliberations of the Nicaraguan minister and Mr. Joseph White, the legal adviser of that body. The company is under the nominal presidency of Mr. Stevens, of New York, and is said to comprise some persons of credit and substantial resources, but Mr. White is the active agent in the enterprise. If not officially recognized, his project is viewed with favor by the American Cabinet, and I think it may very probably be carried into operation.

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NAPIER.

48.—*General Cass to Lord Napier.*

WASHINGTON, *October* 20, 1857.

MY LORD: I have had the honor to receive your lordship's communication of the 9th instant, in reference to the existing relations between Nicaragua and Costa Rica, and have submitted it to the consideration of the President.

These relations have attracted the earnest attention of the President, not only from the importance of the San Juan transit to the commerce of the world, but from the interest which is naturally felt by the United States in the neighboring republics of this continent. The President

has witnessed, therefore, the restoration of peace to Nicaragua and Costa Rica with the highest gratification; and he sincerely hopes that it may not again be interrupted either by the calamity of civil war or the invasion of their territory from other countries. Their security and welfare would undoubtedly be promoted by a just and friendly settlement between them of their mutual boundaries and jurisdiction; and I need hardly add that such an adjustment would be viewed with satisfaction by the United States. This government, however, has never admitted the pretensions of Costa Rica to an equal control with Nicaragua of the San Juan River, but has regarded the sovereignty of the river, and consequently of the interoceanic transit by that route, as rightfully belonging to the Republic of Nicaragua.

A similar view of the question appears to have been recognized by Great Britain, and, whatever may be the rights of Costa Rica with respect to the free passage of her own products by the river to the ocean, it is better, probably, that what has been thus acquiesced in, and has led moreover to important contracts and responsibilities, should not now be disturbed. But under any circumstances the commercial nations of the world can never permit the interoceanic passages of the isthmus to be rendered useless for all the great purposes which belong to them in consequence of the neglect or incapacity of the states through whose territories they happen to run. The United States, as I have before had occasion to assure your lordship, demand no exclusive privileges in these passages, but will always exert their influence to secure their free and unrestricted benefits, both in peace and war, to the commerce of the world. The rumored invasion of Central America, which your lordship apprehends may delay the re-establishment of the transit service through Nicaragua, has not escaped the attention of the President, and his views on the subject are clearly indicated in the circular from this Department of the 18th ultimo, which has been printed in the public journals, and has not escaped your lordship's notice.

No nation on earth, it is believed, appreciates its national rights and duties more highly than the United States, and no one is more ready to concede to other nations, whether strong or weak, that measure of justice which it claims for itself. Any such expedition as that which has been mentioned is forbidden, under severe penalties, by the laws of this country, and these laws the President will take care, on all proper occasions, to enforce.

I have thus endeavored to meet the frank suggestions of your lordship by restating, with corresponding frankness, the general policy of the United States with respect to the governments and the interoceanic transits of Central America; but since your lordship has referred to the Clayton-Bulwer treaty of 1850 as contemplating a "harmonious course of action and counsel between the contracting parties in the settlement of the Central American interests," you will pardon me for reminding your lordship that the differences which this treaty was intended to adjust between the United States and Great Britain still remain unsettled, while the treaty itself has became the subject of new and embarrassing complications.

Until these disagreements can be removed, and the states of Central America can be left to that independent control of their own affairs, with which the continued claims of Great Britain in that quarter seem to this government quite inconsistent, it is easy to see that the harmony of action and counsel between this government and that of Her Britannic Majesty, to which your lordship refers, must be always attended with difficulty, if not found impossible.

It was hoped that these differences would be removed by the approval, on the part of Great Britain, of the amended treaty of October 17, 1856, which had been sanctioned by the President in a spirit of amity towards that kingdom, although its provisions were not wholly in accordance with his views. But the British Government found it necessary to withhold their approval, and the treaty was returned from London unratified.

It was impossible for this government to consent to the treaty in its original form, for reasons which your lordship well understands, and no further discussion has been had on the subject between the two governments.

The President still entertains an earnest hope that all subjects of disagreement which now exist between the United States and Great Britain may be harmoniously adjusted at an early day, but he cannot be insensible to the long delay which has attended their negotiations on the subject of Central America, or to the serious difficulties which the continuance of this delay is calculated to produce.

I avail, &c.,

LEWIS CASS.

49.—*Lord Napier to Lord Clarendon.*

[Extract.]

No. 26.] WASHINGTON, *October* 22, 1857. (Received November 9.)

On receiving an intimation from your lordship that Her Majesty's Government had determined to send out a special minister to Central America, with a view of adjusting the questions under discussion in that quarter, I sought an interview with the President for the purpose of communicating this intelligence to his Excellency.

The President received me on the afternoon of the 19th instant, and I was enabled to report to your lordship by the mail of the same day, in a private form, the substance of a conversation which I have now the honor to submit to your lordship with more accuracy and extension.

I stated to the President that, since the failure of the late overtures consequent on the non-ratification of the treaty of 1856, Her Majesty's Government had considered the several alternatives of action which were open to their selection, and on a review of the whole case, had resolved to dispatch a representative of authority and experience to Central America, charged to make a definitive settlement of all the matters with regard to which the United States and England were still at variance.

This conclusion had been embraced for some time past, and the delay which had occurred was referable partly to the difficulty of selecting a competent person for a duty which involved much personal inconvenience, and demanded peculiar qualifications, and partly to the nature of the intelligence from India, which had of late absorbed the attention of the English cabinet.

Her Majesty's Government had, however, now appointed Sir William Gore Ouseley for the service alluded to, and felt the greater satisfaction in doing so because he was intimately known to the President and enjoyed his good opinion.

I could not state exactly the character of the instructions with which

Sir William Ouseley would be charged, but I might infer from all that had reached me that they would virtually be to the following effect:

The efforts of the new plenipotentiary would be directed to those objects which had been dealt with in the treaty of 1856, now laid aside, viz, the cession of the Bay Islands to Honduras, the substitution of the sovereignty of Nicaragua for the protectorate of England in Mosquito, and the regulation of the frontiers of Belize.

In short, I believed it was the intention of Her Majesty's Government to carry the Clayton-Bulwer treaty into execution according to the general tenor of the interpretation put upon it by the United States, but to do so by separate negotiation with the Central American Republics, in lieu of a direct engagement with the Federal Government.

The President commenced his observations by referring to the Clayton-Bulwer treaty as a fruitful source of misunderstanding between the contracting parties. Without that treaty the United States and Great Britain might long since have co-operated for the welfare of Central America. That treaty had never been acceptable to the people of the United States, and would not have obtained a vote in the Senate, had the least suspicion existed of the sense in which it was to be construed by Great Britain; yet if it were now the intention of Her Majesty's Government to execute it according to the American interpretation, that was as much as he could insist upon.

In any arrangement entered into with this purpose, he must, however, remark that the Government of the United States could not recognize as satisfactory the cession of the Bay Islands to Honduras, with stipulations similar to those contained in the treaty lately negotiated between England and that republic, which left the Bay Islands as much under the protection of Great Britain as Mosquito. He did not know what had become of that treaty.

I replied that I felt convinced it had been the intention of Her Majesty's Government to deliver the islands to Honduras in full sovereignty, and that the franchises awarded to them by the treaty were designed for the freedom of trade, the protection of the vested interests of British subjects, and the welfare of the inhabitants.

I added that his excellency was well aware of the convictions conscientiously held in England respecting slavery, and of the respect which Her Majesty's Government owed to public feeling on that subject. I might plainly affirm that a principal motive in framing securities for the after government of the Bay Islands had been the apprehension that, when relinquished by the English authorities, those islands would be settled by planters from the United States, who would bring their negroes with them, and thus establish slavery on soil which had, justly or unjustly, been declared to be a colonial dependency of Great Britain.

Her Majesty's Government, moreover, regarded the Bay Islands as forming, in a manner, one of the termini of the Honduras transit route, and therefore desired to see them endowed with the privileges of a free port, the Island of Tigre, in the Gulf of Fonsega, at the other extremity, having long possessed those immunities.

The President contended that the stipulations were uncalled for and that Her Majesty's Government might have surrendered the islands freely, and subsequently enforced on the Government of Honduras a due respect to the claims of British settlers.

In reply to his excellency, I allowed that the articles establishing the administrative independence of the islands might have been larger than was necessary. I had observed the same impression in the corre-

spondence of Mr. Wyke, Her Majesty's chargé d'affaires at Guatemala, who seemed to admit that a greater participation in the internal government might be granted to the authorities of Honduras; that I made no doubt Her Majesty's Government would entertain any reasonable suggestions which might be afforded to them in that sense. As far as I knew the discussion was not closed, and Sir William Ouseley would, probably, have power to enter upon it in a liberal spirit.

I then went on to animadvert upon the danger of some movement in the approaching Congress which would interfere with the contemporary negotiation of Sir William Ouseley, remarking that should the President in his message allude to the position of the two countries in reference to Central America, and if, in consequence of his excellency's reflections a resolution should be proposed for the abrogation of the Clayton-Bulwer treaty, such a step would not only frustrate the purposes of Sir William Ouseley's mission, but would have a calamitous influence on the future relations of England and America. It would, therefore, be highly gratifying to me to be enabled to assure your lordship that, pending the negotiation intrusted to Sir William Ouseley, no proposal to annul the treaty would be sanctioned or encouraged by his excellency or by the members of his government.

The President stated, in reply, that it was certainly his intention to give an account in his message of all that has passed between the two governments respecting the Dallas-Clarendon treaty. He appeared to intimate that the effect of such a narrative would be to place the conduct of Great Britain in an unfavorable light, and he added that the passage in which he commented upon these transactions was already prepared; but his excellency went on to affirm, with emphasis, that if the resolutions of Her Majesty's Government were such as I had related, if they really meant to execute the Clayton-Bulwer treaty according to the American interpretation, and would, before the meeting of Congress, make some communication to him in that sense, such as he could use, he would cancel what he had written and insert another passage referring to the mission of Sir William Ouseley, and that "nothing would give him greater pleasure than to add the expression of his sincere and ardent wish for the maintenance of friendly relations between the two countries."

His excellency also distinctly declared that, under the circumstances here described, no attempt against the Clayton–Bulwer treaty in Congress would have any countenance from him whatever. To him it was indifferent whether the concessions contemplated by Her Majesty's Government were consigned to a direct engagement between England and the United States, or to treaties between the former and the Central American republics. The latter method might, in some respects, be even more agreeable to him, and he thought it would be more convenient to Her Majesty's Government, who might, with greater facility, accede to the claims of the weaker party.

I thanked the President for his assurances, and expressed my hope that your lordship would be enabled to make a full communication of Sir William Ouseley's instructions to the American Cabinet, and even to direct that minister to visit Washington, on his way to Central America, if his excellency thought such a step would be advisable. The President replied that a written communication would be sufficient, even if it reached him a few days before the meeting of Congress.

In the course of this interview the President touched incidentally upon the Honduras Railway, which he trusted might prove a successful enterprise, although the impressions which reached him were un-

favorable to its practicability, or, at least, to its profitable execution. In this sentiment I concurred with the President, and avowed my apprehension that the undertaking would be the grave of a vast amount of British capital, which had been already so extensively wasted on the American continents.

Allusion having been made to the relations of Costa Rica and Nicaragua, the President asserted that the United States aimed at no exclusive privileges and at no possession in that region; their interests and those of Great Britain were identical. I answered that such had always been my persuasion and my language, and that the parties who had obtained concessions from Costa Rica for the transit or the navigation of the River San Juan, acted, in my belief, without any sanction or authority from Her Majesty's Government. The jurisdiction of the transit was vested in Nicaragua; but Her Majesty's Government, I thought, would desire to secure the beneficial use of the river to Costa Rica for the purposes of import and export trade—a claim which seemed equitable and consistent with the views of the United States with reference to the navigation of the Amazon.

I have the pleasure of reporting to your lordship that the President took occasion to declare his satisfaction in the sympathy which had been displayed throughout the United States towards England since the outbreak of the Indian mutiny, and his own confidence in the success of Her Majesty's arms, which was to be desired in the interest of the natives of Hindostan.

At the conclusion of the interview, as I rose to take my leave, the President resumed the subject and said:

I shall be satisfied on condition that the British Government sends a minister to Central America, instructed to settle all the questions which have been controverted between the two governments according to the American construction of the treaty, and upon receiving an official assurance to this effect I shall change the character of my message.

In affirming the present policy of Her Majesty's Government to be "the execution of the Clayton-Bulwer treaty according to the general tenor of the interpretation placed upon it by the United States," I trust that I have not misconstrued the views of Her Majesty's Government in the mission of Sir William Ouseley.

I am careful in my language on this subject to mark that I spoke on a broad impression of your lordship's intentions, and not on a particular official knowledge of the decision of Her Majesty's Government.

I need not add that the engagements of the President do not depend in any degree on what I have hazarded on my own responsibility, but are altogether contingent on the nature of the communication which his excellency may receive before the 4th of next December, when Congress will assemble.

NAPIER.

The EARL OF CLARENDON.

50.—*Cass-Yrisarri treaty, November* 16, 1857.

The Republic of Nicaragua and the United States of America, being desirous to maintain with each other the most friendly relations, to promote the commercial intercourse of their respective citizens, and to make some mutual arrangement with respect to a communication between the Atlantic and Pacific Oceans by the river San Juan de Nicaragua and either or both the lakes of Nicaragua and Managua, or by any other

route through the territories of said Republic of Nicaragua, have deemed it expedient to conclude a treaty of friendship, commerce and navigation, and for this purpose have named the following plenipotentiaries, that is to say:

The Republic of Nicaragua, Antonio José de Yrisarri, her envoy extraordinary and minister plenipotentiary in the United States of America;

And the President of the United States of America, Lewis Cass, Secretary of State of the United States; who, after having communicated to each other their full powers, found to be in due and proper form, have agreed upon and concluded the following articles:

ARTICLE I.

There shall be perpetual amity between the United States and their citizens, on the one part, and the Government of the Republic of Nicaragua and its citizens on the other.

ARTICLE II.

There shall be, between all the territories of the United States and the territories of the Republic of Nicaragua, a reciprocal freedom of commerce. The subjects and citizens of the two countries, respectively, shall have full liberty, freely and securely, to come, with their ships and cargoes, to all places, ports, and rivers, in the territories aforesaid, to which other foreigners are, or may be, permitted to come, to enter into the same, and to remain and reside in any part thereof, respectively; also, to hire and occupy houses and warehouses for the purposes of their commerce; and generally the merchants and traders of each nation, respectively, shall enjoy the most complete protection and security for their commerce, subject always to the laws and statutes of the two countries, respectively.

In like manner the respective ships of war and post-office packets of the two countries shall have liberty, freely and securely, to come to all harbors, rivers, and places to which other foreign ships of war and packets are, or may be, permitted to come, to enter the same, to anchor, and to remain there and refit, subject always to the laws and statutes of the two countries, respectively.

By the right of entering places, ports, and rivers, mentioned in this article, the privilege of carrying on the coasting trade is not understood, in which trade national vessels only of the country where the trade is carried on are permitted to engage.

ARTICLE III.

It being the intention of the two high contracting parties to bind themselves, by the preceding articles, to treat each other on the footing of the most favored nation, it is hereby agreed between them that any favor, privilege, or immunity whatever, in matters of commerce and navigation, which either contracting party has actually granted, or may grant hereafter, to the subjects or citizens of any other State, shall be extended to the subjects of the other contracting party gratuitously, if the concession in favor of that other nation shall have been gratuitous, or in return for a compensation, as nearly as possible, of proportionate value and effect, to be adjusted by mutual agreement if the concession shall have been conditional.

ARTICLE IV.

No higher nor other duties shall be imposed on the importation into the territories of the United States of any article being the growth, produce, or manufacture of the Republic of Nicaragua, and no higher or other duties shall be imposed on the importation into the territories of the Republic of Nicaragua of any articles being the growth, produce, or manufacture of the territories of the United States than are, or shall be, payable upon the like articles being the growth, produce, or manufacture of any other foreign country; nor shall any other or higher duties or charges be imposed in the territories of either of the high contracting parties on the exportation of any articles to the territories of the other than such as are, or may be, payable on the exportation of the like articles to any other foreign country; nor shall any prohibition be imposed upon the exportation or importation of any articles the growth, produce, or manufacture of the territories of the United States or the Republic of Nicaragua, to or from the said territories of the United States, or to or from the Republic of Nicaragua, which shall not equally extend to all other nations.

ARTICLE V.

No higher nor other duties or payments, on account of tonnage, of light or harbor dues, or pilotage, of salvage in case of either damage or shipwreck, or on account of any local charges, shall be imposed in any of the ports of Nicaragua on vessels of the United States than those payable by Nicaraguan vessels; nor in any of the ports of the United States on Nicaraguan vessels than shall be payable in the same ports on vessels of the United States.

ARTICLE VI.

The same duties shall be paid on the importation into the territories of the Republic of Nicaragua of any article being the growth, produce and manufacture of the territories of the United States, whether such importations shall be made in Nicaraguan vessels or in vessels of the United States; and the same duties shall be paid on the importation into the territories of the United States of any article being the growth, produce, or manufacture of the Republic of Nicaragua, whether such importation shall be made in United States or Nicaraguan vessels.

The same dues shall be paid and the bounties and drawbacks allowed on the exportation to the Republic of Nicaragua of any articles being the growth, produce, or manufacture of the territories of the United States, whether such exportations shall be made in Nicaraguan or United States vessels; and the same duties shall be paid and the same bounties and drawbacks allowed on the exportation of any articles being the growth, produce, or manufacture of the Republic of Nicaragua to the territories of the United States, whether such exportation shall be made in the vessels of the United States or of Nicaragua.

ARTICLE VII.

All merchants, commanders of ships, and others, citizens of the United States, shall have full liberty in all the territories of the Republic of Nicaragua to manage their own affairs themselves, as permitted by the

laws, or to commit them to the management of whomsoever they please, as broker, factor agent, or interpreter; nor shall they be obliged to employ any other persons in those capacities than those employed by Nicaraguans, nor to pay them any other salary or remuneration than such as is paid in like cases by Nicaraguan citizens; and absolute freedom shall be allowed in all cases to the buyer and seller to bargain and fix the price of any goods, wares, or merchandise imported into, or exported from, the Republic of Nicaragua, as they shall see good, observing the laws and established customs of the country.

The same privileges shall be enjoyed in the territories of the United States by the citizens of the Republic of Nicaragua under the same conditions.

The citizens of the high contracting parties shall reciprocally receive and enjoy full and perfect protection for their persons and property, and shall have free and open access to the courts of justice in said countries, respectively, for the prosecution and defense of their just rights; and they shall be at liberty to employ, in all cases, the advocates, attorneys, or agents, of whatever description, whom they may think proper; and they shall enjoy, in this respect, the same rights and privileges therein as native citizens.

ARTICLE VIII.

In whatever relates to the police of the ports, the lading and unlading of ships, the safety of the merchandise, goods, and effects; the succession to personal estates, by will or otherwise; and the disposal of personal property of every sort and denomination, by sale, donation, exchange, testament, or any other manner whatsoever, as also the administration of justice, the citizens of the two high contracting parties shall reciprocally enjoy the same privileges, liberties, and rights as native citizens; and they shall not be charged, in any of these respects, with any higher imposts or duties than those which are, or may be, paid by native citizens, submitting, of course, to the local laws and regulations of each country, respectively.

The foregoing provisions shall be applicable to real estate situated within the States of the American Union or within the Republic of Nicaragua, in which foreigners shall be entitled to hold or inherit real estate.

But in case real estate situated within the territories of one of the contracting parties should fall to a citizen of the other party, who, on account of his being an alien, could not be permitted to hold such property in the state in which it may be situated, there shall be accorded to the said heir, or other successor, such term as the laws of the state will permit to sell such property; he shall be at liberty at all times to withdraw and export the proceeds thereof without difficulty, and without paying to the government any other charges than those which, in a similar case, would be paid by an inhabitant of the country in which the real estate may be situated.

If any citizen of either of the two high contracting parties shall die without a will or testament in any of the territories of the other, the minister or consul or other diplomatic agent of the nation to which the deceased belonged (or the representative of such minister or consul or other diplomatic agent, in case of absence), shall have the right to nominate curators to take charge of the property of the deceased, so far as the laws of the country will permit, for the benefit of the lawful heirs and creditors of the deceased, giving proper notice of such nomination to the authorities of the country.

ARTICLE IX.

1. The citizens of the United States residing in Nicaragua, or the citizens of Nicaragua residing in the United States, may intermarry with the natives of the country, hold and possess, by purchase, marriage, or descent, any estate, real or personal, without thereby changing their national character, subject to the laws which now exist or may be enacted in this respect.

2. The citizens of the United States residents in the Republic of Nicaragua, and the citizens of Nicaragua residents in the United States, shall be exempted from all forced (or compulsory) military service whatsoever, by land or sea; from all contributions of war, military exactions, forced loans in time of war; but they shall be obliged in the same manner as the citizens of each nation to pay lawful taxes, municipal and other modes of imposts and ordinary charges, loans, and contributions in time of peace (as the citizens of the country are liable), in just proportion to the property owned.

3. Nor shall the property of either, of any kind, be taken for any public object, without full and just compensation to be paid in advance; and,

4. The citizens of each of the two high contracting parties shall have the unlimited right to go to any part of the territories of the other, and in all cases enjoy the same security as the natives of the country where they reside, with the condition that they duly observe the laws and ordinances.

ARTICLE X.

It shall be free for each of the two high contracting parties to appoint consuls for the protection of trade, to reside in any of the territories of the other party.

But before any consul shall act as such, he shall, in the usual form, be approved and admitted by the government to which he is sent, and either of the high contracting parties may except from the residence of consuls such particular places as they judge fit to be excepted.

The diplomatic agents of Nicaragua and consuls shall enjoy in the territories of the United States whatever privileges, exemptions, and immunities whatever as are, or shall be, allowed to the agents of the same rank belonging to the most favored nations; and, in like manner, the diplomatic agents and consuls of the United States in Nicaragua, shall enjoy, according to the strictest reciprocity, whatever privileges, exemptions, and immunities that are, or may be, granted in the Republic of Nicaragua to the diplomatic agents and consuls of the most favored nations.

ARTICLE XI.

For the better security of commerce between the citizens of the United States and the citizens of Nicaragua it is agreed that if at any time any interruption of friendly intercourse or any rupture should unfortunately take place between the two high contracting parties, the citizens of either, who may be within the territories of the other, shall, if residing on the coast, be allowed six months, and if in the interior, a whole year, to wind up their accounts and dispose of their property; and a safe conduct shall be given to them to embark at any port they themselves may select. Even in case of a rupture all such citizens of either of the high contracting parties, who are established in any of the territories of the other in trade or other employment, shall have the privilege of remain-

ing and of continuing such trade or employment without any manner of interruption, in the full enjoyment of liberty and property, so long as they behave peacefully and commit no offense against the laws, and their goods and effects, of whatever description they may be, whether in their own custody or instrusted to individuals, or to the state, shall not be liable to seizure or sequestration nor to any other charges or demands than those which may be made upon the like effects or property belonging to the native citizens of the country in which such citizens may reside. In the same case, debts between individuals, property out in public funds, and shares of companies, shall never be confiscated nor detained.

ARTICLE XII.

The citizens of the United States and the citizens of the Republic of Nicaragua, respectively, residing in any of the territories of the other party shall enjoy in their houses, persons, and property the protection of the government, and shall continue in possession of the guarantees which they now enjoy. They shall not be disturbed, molested, or annoyed in any manner on account of their religious belief, nor in the proper exercise of their religion, agreeably to the system of tolerance established in the territories of the high contracting parties, provided they respect the religion of the nation in which they reside, as well as the constitution, laws, and customs of the country.

Liberty shall be also granted to bury the citizens of either of the two high contracting parties who may die in the territories aforesaid, in burial places of their own, which, in the same manner, may be freely established and maintained; nor shall the funerals or sephulchres of the dead be disturbed in any way or upon any account.

ARTICLE XIII.

Whenever the citizens of either of the contracting parties shall be forced to seek refuge or asylum in the rivers, bays, ports, or dominions of the other, with their vessels, whether merchant or war, public or private, through stress of weather, pursuit of pirates or enemies, or want of provisions or water, they shall be received and treated with humanity and given all favor and protection for repairing their vessels, procuring provisions and placing themselves in all respects in a condition to continue their voyage without obstacle or hinderance of any kind.

ARTICLE XIV.

The Republic of Nicaragua hereby grants to the United States, and to their citizens and property, the right of transit between the Atlantic and Pacific Oceans through the territories of that republic on any route of communication, natural or artificial, whether by land or water, which may now or hereafter exist or be constructed under the authority of Nicaragua, to be used and enjoyed, in the same manner and upon equal terms by both republics and their respective citizens, the Republic of Nicaragua, however, reserving its right of sovereignty over the same.

ARTICLE XV.

The United States hereby agree to extend their protection to all such routes of communication as aforesaid, and to guarantee the neutrality

of the same. They also agree to employ their influence with other nations to induce them to guarantee such neutrality and protection.

And the Republic of Nicaragua on its part undertakes to establish two free ports, one at each of the extremities of the communications aforesaid on the Atlantic and Pacific Oceans. At these ports no tonnage or other duties shall be imposed or levied by the Government of Nicaragua on the vessels of the United States, or on any effects or merchandise belonging to citizens or subjects of the United States, or upon the vessels or effects of any other country intended *bona fide* for transit across the said routes of communication and not for consumption, within the Republic of Nicaragua.

The United States shall also be at liberty to carry troops and munitions of war in their own vessels or otherwise to either of the said free ports, and shall be entitled to their conveyance between them without obstruction by the authorities of Nicaragua, and without any charges or tolls whatever for their transportation on either of said routes of communication. And no higher or other charges or tolls shall be imposed on the conveyance or transit of persons or property of citizens or subjects of the United States or of any other country across the said routes of communication than are or may be imposed on the persons and property of citizens of Nicaragua. And the Republic of Nicaragua recognizes the right of the Postmaster-General of the United States to enter into contracts with any individuals or companies to transport the mails of the United States along the said routes of communication, or along any other routes across the isthmus, in its discretion, in closed bags, the contents of which may not be intended for distribution within the said republic, free from the imposition of all taxes or duties by the Government of Nicaragua; but this liberty is not to be construed so as to permit such individuals or companies, by virtue of this right to transport the mails, to carry also passengers or freight.

Article XVI.

The Republic of Nicaragua agrees that, should it become necessary at any time to employ military force for the security and protection of persons and property passing over any of the routes aforesaid, it will employ the requisite force for that purpose; but, upon failure to do this for any cause whatever, the Government of the United States may, after notice to the Government of Nicaragua, or to the minister thereof in the United States, employ such force, for this and for no other purpo e; and when the necessity ceases, such force shall be immediately withdrawn.

Article XVII.

It is understood, however, that the United States, in according protection to such routes of communication, and guaranteeing their neutrality and security, always intend that the protection and guarantee are granted conditionally, and may be withdrawn if the United States should deem that the persons or company undertaking or managing the same adopt or establish such regulations concerning the traffic thereupon as are contrary to the spirit and intention of this treaty, either by making unfair discriminations in favor of the commerce of any nation or nations over the commerce of any other nation or nations, or by imposing oppressive exactions or unreasonable tolls upon mails, passengers, vessels, goods, wares, merchandise, or other articles.

The aforesaid protection and guarantee shall not, however, be withdrawn by the United States without first giving six months' notice to the Republic of Nicaragua.

ARTICLE XVIII.

And it is further understood and agreed that in any grants or contracts which may hereafter be made or entered into by the Government of Nicaragua having reference to the interoceanic routes above referred to, or either of them, the rights and privileges granted by this convention to the Government and citizens of the United States shall be fully protected and reserved. And if any such grants or contracts now exist of a valid character, it is further understood that the guarantee and protection of the United States stipulated in Article XV of this treaty shall be held inoperative and void until the holders of such grants or contracts shall recognize the concessions made in this treaty to the Government and citizens of the United States with respect to such interoceanic routes, or either of them, and shall agree to observe and be governed by those concessions as fully as if they had been embraced in their original grants or contracts; after which recognition and agreement, said guarantee and protection shall be in full force; provided that nothing herein contained shall be construed either to affirm or deny the validity of any of the said contracts.

ARTICLE XIX.

After ten years from the completion of a railroad or any other route of communication through the territory of Nicaragua, from the Atlantic to the Pacific Ocean, no company which may have constructed or be in possession of the same shall ever divide, directly or indirectly, by the issue of new stock, the payment of dividends, or otherwise, more than fifteen per cent. per annum, or at that rate, to its stockholders from tolls collected thereupon; but whenever the tolls shall be found to yield a larger profit than this, they shall be reduced to the standard of fifteen per cent. per annum.

ARTICLE XX.

It is understood that nothing contained in this treaty shall be construed to affect the claim of the government and citizens of the Republic of Costa Rica to a free passage by the San Juan River for their persons and property to and from the ocean.

ARTICLE XXI.

The two high contracting powers, desiring to make this treaty as durable as possible, agree that this treaty shall remain in full force for the term of twenty years from the day of the exchange of the ratifications; and either party shall have the right to notify the other of its intention to terminate, alter, or reform this treaty, at least twelve months before the expiration of the twenty years; if no such notice be given, then this treaty shall continue binding beyond the said time, and until twelve months shall have elapsed from the day on which one of the parties shall notify the other of its intention to alter, reform, or abrogate this treaty.

ARTICLE XXII.

The present treaty shall be ratified, and the ratifications exchanged, at Washington City, within the space of nine months, or sooner, if possible.

In witness whereof the respective plenipotentiaries have signed the same, and affixed thereto their respective seals.

Done at the city of Washington, this sixteenth of November, in the year of our Lord one thousand eight hundred fifty-seven.

LEWIS CASS.
A. J. DE YRISARRI.

51.—*Lord Napier to General Cass.*

[Extract.]

WASHINGTON, *November* 30, 1857.

SIR: * * * * * *

2. In framing stipulations for the compensation, the government, and the preservation of the Mosquito Indians under the sovereignty of Nicaragua, Sir William Ouseley will be guided by the provisions of the treaty of 1856, which, although it did not acquire the validity of an international engagement, may on this point be held to express the policy and opinions of the contracting parties. The limits of the territorial reserve may be subject to modification, but the boundaries proposed to Nicaragua and Honduras will certainly not be less favorable than those indicated by the treaty alluded to; they will in no degree trespass on the territory applicable to transit purposes, and in the settlement of details Her Majesty's envoy will grant an indulgent consideration to the wishes and necessities of the Central American governments when they are compatible with the safety and the welfare of those native tribes which have previously enjoyed the protection of the British crown.

3. The regulation of the frontier of British Honduras will be effected by negotiation with the Government of Guatemala. Her Majesty's Government trusts to obtain from this republic a recognition of limits, which, if we may judge from previous communication on this subject, may be accepted in a spirit of conciliation if not with absolute approval by the President.

Such is, in outline, the basis of the negotiation committed to Sir William Ouseley, as far as regards the construction and execution of the provisions of the Clayton-Bulwer treaty. The interpretation of that instrument thus practically sanctioned by Her Majesty's Government may not strictly coincide with that which is adopted, no doubt in perfect sincerity, by the United States; but the present resolution of Her Majesty's Government involves no slight relaxations of the sense in which, in equal good faith, the engagements of 1850 were contracted by Great Britain. It is hoped that the concessions of Her Majesty's Government will be met in a similar temper by the Government of the United States, that the mission of Sir William Ouseley will be regarded with benevolence, and that, if successfully accomplished, its results will be embraced as an honorable compromise of contending opinions, and as a definitive settlement of those disputed points which have so long attracted the anxious attention of our respective governments.

* * * * * * *

NAPIER.

52.—*President Buchanan's message to Congress, December* 8, 1857.

[Extract.]

The diplomatic difficulties which existed between the Government of the United States and that of Great Britain at the adjournment of the last Congress, have been happily terminated by the appointment of a British minister to this country, who has been cordially received.

Whilst it is greatly to the interest, as I am convinced it is the sincere desire, of the governments and people of the two countries to be on terms of intimate friendship with each other, it has been our misfortune almost always to have had some irritating, if not dangerous, outstanding question with Great Britain.

Since the origin of the government we have been employed in negotiating treaties with that power, and afterwards in discussing their true intent and meaning. In this respect the convention of April 19, 1850, commonly called the Clayton and Bulwer treaty, has been the most unfortunate of all; because the two governments place directly opposite and contradictory constructions upon its first and most important article. Whilst in the United States, we believed that this treaty would place both powers upon an exact equality by the stipulation that neither will ever "occupy, or fortify, or colonize, or assume or exercise any dominion" over any part of Central America, it is contended by the British Government that the true construction of this language has left them in the rightful possession of all that portion of Central America which was in their occupancy at the date of the treaty; in fact, that the treaty is a virtual recognition on the part of the United States of the right of Great Britain, either as owner or protector, to the whole extensive coast of Central America, sweeping round from the Rio Hondo to the port and harbor of San Juan de Nicaragua, together with the adjacent Bay Islands, except the comparatively small portion of this between the Sarstoon and Cape Honduras. According to their construction, the treaty does no more than simply prohibit them from extending their possessions in Central America beyond the present limits. It is not too much to assert, that if in the United States the treaty had been considered susceptible of such a construction, it never would have been negotiated under the authority of the President, nor would it have received the approbation of the Senate. The universal conviction in the United States was, that when our Government consented to violate its traditional and time-honored policy, and to stipulate with a foreign government never to occupy or acquire territory in the Central American portion of our continent, the consideration for this sacrifice was that Great Britain should, in this respect, at least, be placed in the same position with ourselves.

Whilst we have no right to doubt the sincerity of the British Government in their construction of the treaty, it is at the same time my deliberate conviction that this construction is in opposition both to its letter and its spirit.

Under the late administration negotiations were instituted between the two governments for the purpose, if possible, of removing these difficulties; and a treaty having this laudable object in view was signed at London on the 17th October, 1856, and was submitted by the President to the Senate on the following 10th of December.

Whether this treaty, either in its original or amended form, would have accomplished the object intended without giving birth to new and embarrassing complications between the two governments, may perhaps

be well questioned. Certain it is, however, it was rendered much less objectionable by the different amendments made to it by the Senate.

The treaty, as amended, was ratified by me on the 12th March, 1857, and was transmitted to London for ratification by the British Government. That government expressed its willingness to concur in all the amendments made by the Senate, with the single exception of the clause relating to Ruatan and the other islands in the Bay of Honduras. The article in the original treaty, as submitted to the Senate, after reciting that these islands and their inhabitants—

> having been by a convention bearing date the 27th day of August, 1856, between Her Britannic Majesty and the Republic of Honduras, constituted and declared a free territory under the sovereignty of the said Republic of Honduras—

stipulated that—

> the two contracting parties do hereby mutually engage to recognize and respect in all future time the independence and rights of the said free territory as a part of the Republic of Honduras.

Upon an examination of this convention between Great Britain and Honduras of the 27th August, 1856, it was found that, whilst declaring the Bay Islands to be "a free territory under the sovereignty of the Republic of Honduras," it deprived that republic of rights without which its sovereignty over them could scarcely be said to exist. It divided them from the remainder of Honduras, and gave to their inhabitants a separate government of their own, with legislative, executive, and judicial officers, elected by themselves. It deprived the government of Honduras of the taxing power in every form, and exempted the people of the islands from the performance of military duty, except for their own exclusive defense. It also prohibited that republic from erecting fortifications upon them for their protection, thus leaving them open to invasion from any quarter; and, finally, it provided "that slavery shall not at any time hereafter be permitted to exist therein."

Had Honduras ratified this convention, she would have ratified the establishment of a state substantially independent within her own limits, and a state at all times subject to British influence and control. Moreover, had the United States ratified the treaty with Great Britain in its original form, we should have been bound "to recognize and respect in all future time" these stipulations to the prejudice of Honduras. Being in direct opposition to the spirit and meaning of the Clayton and Bulwer treaty, as understood in the United States, the Senate rejected the entire clause, and substituted in its stead a simple recognition of the sovereign right of Honduras to these islands, in the following language:

> The two contracting parties do hereby mutually engage to recognize and respect the islands of Ruatan, Bonaco, Utila, Barbaretta, Helena, and Morat, situate in the Bay of Honduras, and off the coast of the Republic of Honduras, as under the sovereignty and as part of the said Republic of Honduras.

Great Britain rejected this amendment, assigning as the only reason that the ratifications of the convention of the 27th August, 1856, between her and Honduras, had not been "exchanged, owing to the hesitation of that government." Had this been done, it is stated that "Her Majesty's Government would have had little difficulty in agreeing to the modification proposed by the Senate, which then would have had, in effect, the same signification as the original wording." Whether this would have been the effect; whether the mere circumstance of the exchange of the ratifications of the British convention with Honduras prior, in point of time, to the ratification of our treaty with Great Britain

would "in effect" have had "the same signification as the original wording," and thus have nullified the amendment of the Senate, may well be doubted. It is, perhaps, fortunate that the question has never arisen.

The British Government, immediately after rejecting the treaty as amended, proposed to enter into a new treaty with the United States, similar in all respects to the treaty which they had just refused to ratify, if the United States would consent to add to the Senate's clear and unqualified recognition of the sovereignty of Honduras over the Bay Islands, the following conditional stipulation:

> Whenever and so soon as the Republic of Honduras shall have concluded and ratified a treaty with Great Britain, by which Great Britain shall have ceded, and the Republic of Honduras shall have accepted the said islands, subject to the provisions and conditions contained in such treaty.

This proposition was, of course, rejected. After the Senate had refused to recognize the British convention with Honduras of the 27th August, 1856, with full knowledge of its contents, it was impossible for me, necessarily ignorant of "the provisions and conditions" which might be contained in a future convention between the same parties, to sanction them in advance.

The fact is, that when two nations like Great Britain and the United States, mutually desirous, as they are, and I trust ever may be, of maintaining the most friendly relations with each other, have unfortunately concluded a treaty which they understand in senses directly opposite, the wisest course is to abrogate such a treaty by mutual consent, and to commence anew. Had this been done promptly, all difficulties in Central America would most probably ere this have been adjusted to the satisfaction of both parties. The time spent in discussing the meaning of the Clayton and Bulwer treaty would have been devoted to this praiseworthy purpose, and the task would have been more easily accomplished because the interest of the two countries in Central America is identical, being confined to securing safe transits over all the routes across the Isthmus.

Whilst entertaining these sentiments, I shall nevertheless no refuset to contribute to any reasonable adjustment of the Central American questions which is not practically inconsistent with the American interpretation of the treaty. Overtures for this purpose have been recently made by the British Government in a friendly spirit, which I cordially reciprocate; but whether this renewed effort will result in success I am not yet prepared to express an opinion. A brief period will determine.

53.—*Lord Napier to General Cass.*

WASHINGTON, *February* 15, 1858.

SIR: On the 30th of November last I had the honor to convey to you, under the instructions of Her Majesty's Government, a proposal to submit the controverted points in the treaty of 1850, respecting Central American affairs, to the free arbitration of any European power which the Government of the United States should prefer to select for that office. In a separate note, under the same date, I imparted to the Government of the United States an outline of the instructions under which Sir William Gore Ouseley has been charged to proceed on a special mission to the Central American republics, with a view to the settle-

ment, by direct negotiation with those states, of the questions which the correspondence of last year in London had failed to adjust. Something in the nature of an alternative was thus offered to the American cabinet. Should the expedient of arbitration be adopted, a great portion of Sir William Ouseley's duty would be transferred to other agencies. Should arbitration be declined it was hoped that the efforts of Her Majesty's envoy would result in a settlement agreeable to the United States, inasmuch as in essential points it would carry the treaty of 1850 into operation in a manner practically conformable to the American interpretation of that instruction.

The note which I had the honor of addressing to you, in reference to the mission of Sir W. Ouseley, has received the official sanction of the Earl of Clarendon, and may therefore be regarded as an authoritative exposition of the intentions of Her Majesty's Government. In that communication, however, I indicated that two obstacles had arisen which might possibly modify the resolutions of Her Majesty's Government: first, the cotemporary negotiation of a convention for the protection of the transit route between the Government of the United States and that of Nicaragua; and secondly, the invasion of the Nicaraguan territory by a band of adventurers, who were engaged in an attempt to subvert the lawful government recognized by Great Britain. The impediments to which I alluded do not now exist.

In the treaty contemplated between the United States and Nicaragua, Her Majesty's Government do not see any obstacle in the realization of their designs committed to the management of Sir William Ouseley, while the projects of Walker and his confederates have been arrested by the interposition of the United States Navy, and we may hope definitively extinguished by the reprobation expressed, and the measures adopted by the President of the United States.

Satisfied in respect to the relations between the Government of the United States and Nicaragua, and relieved of the apprehensions raised by the renewed disturbances of the peace of Central America, Her Majesty's Government are prepared, if necessary, to sanction the departure of Sir William Ouseley on his mission and the execution of his instructions in the most conciliatory spirit.

Her Majesty's Government have, however, received no reply to their proposal for arbitration, a measure which they still regard as embodying the most unexceptionable method for the settlement of existing difficulties.

In requesting to be informed of the definitive resolution of the United States Government on this point, I am enabled to add that, if their determination should be an adverse one, Her Majesty's Government would give a friendly consideration to any observations which you may be disposed to offer on the objects of the mission intrusted to Sir William Ouseley.

I have, &c.,

NAPIER.

54.—*Lord Napier to Lord Malmesbury.*

No. 56.] WASHINGTON, *March* 22, 1858. (Received April 5.)

MY LORD: The overtures made by Her Majesty's late cabinet to the Government of the United States for the adjustment of pending controversies in Central America are known to your lordship from the cor-

respondence between the foreign office and Her Majesty's legation on this subject.

Those proposals comprise an alternative submitted to the selection of the American Government. Her Majesty's Government have offered to refer all the controverted points in the treaty of 1850 to the free arbitration of any European power, or, if more agreeable to the United States, they design to adjust the matters under discussion by negotiation with the Isthmus republics, to which, through the medium of Sir William Ouseley's mission, they are prepared to make such concessions as would carry the treaty of 1850 into operation in the most important particulars, according to the construction placed upon that instrument by the cabinet of Washington.

These modes of settlement both involve the maintenance of the Clayton-Bulwer treaty in its essential principle, viz, the neutrality of the Central American region, the exclusion of the contracting parties from territorial acquisition in a country which, from its configuration and position, possesses a common and momentous interest to the maritime powers.

The conciliatory inclinations of Her Majesty's Government have, however, not stopped here. Prompted by an impression, derived from many sources, that the obligations of the Clayton-Bulwer treaty were repugnant to the people of the United States, and influenced, no doubt, by the declaration of the President in his late message to Congress, in which he intimates a desire for the amicable dissolution of that convention, the Earl of Clarendon authorized me to inform General Cass that Her Majesty's Government would not decline the consideration of a proposal for the abrogation of the treaty by mutual concert. An official character was not given to this communication, because the recent overtures of Her Majesty's Government are still under the consideration of the President, and because it seems most natural that the proposal for the repeal of the treaty should emanate from the party to which we are told it has been onerous and unacceptable.

I have, accordingly, on two occasions informed General Cass that if the Government of the United States be still of the same mind, and continue to desire the abrogation of the treaty of 1850, it would be agreeable to Her Majesty's Government that they should insert a proposal to that effect in their reply to my note respecting arbitration, and to that in which I explained the character and motives of the mission intrusted to Her Majesty's commissioner in Central America.

Some conversation ensued regarding the manner in which the dissolution of the treaty should be effected, and the condition by which it might be accompanied, and on these topics I have held the following language, premising that the views expressed were altogether spontaneous and personal, for I had no information of the intentions of Her Majesty's Government beyond the bare fact that they would entertain a proposal to cancel the engagements of 1850, emanating from the United States.

I stated that, in my opinion, the treaty in question could only be repealed by a new treaty in the usual forms, and that it might be desirable that such a treaty should not be restricted to a single article annulling its predecessor. Both for considerations of decency and policy, I advocated the insertion of stipulations involving an expression of a common policy in Central America, and the disavowal of any exclusive or monopolizing projects on either side. I said that I thought a treaty might be framed of three articles.

The first should declare the desire of the contracting parties to en-

courage and protect the organization of transit routes in the inter-oceanic region, and bind those parties never to negotiate for any rights or privileges of transit with the Central American states of a preferential or exclusive character, to which other nations might not, by negotiation, be equally admitted, establishing thus the principle of an equal enjoyment of those avenues of trade for all the countries of the world.

The second article might recognize the jurisdiction of the transit route by the San Juan River, as being vested in the Government of Nicaragua. This had been already avowed by the United States in a treaty negotiated with that republic. It had not been definitively affirmed by Great Britain, and might seem to clash with the claims of the King of Mosquito to territorial possession or authority in those parts. I thought, however, that in regard to the views lately expressed by Her Majesty's Government in the course of recent negotiations, in consideration of the necessity of obtaining a suitable treaty with Nicaragua, and for the purpose of placing themselves in harmony with the course pursued by the United States, Her Majesty's Government might, on this head, accede to an article which would practically restrict their protectorate in Mosquito, and prevent the imputation of any interference on their part with the territory traversed by the river, and therefore by the transit route.

Finally, I suggested that Article III of the treaty should simply declare the provisions of the treaty of 1850 to be void and of no effect. I added that the question of future territorial acquisition in Central America would thus be thrown open to the United States; that Her Majesty's Government, on the other hand, would retain the colony of Honduras in the proportions which might be given to it by treaty arrangements with Guatemala, and that the Bay Islands would remain attached to the British Crown. Indeed, I affirmed, still as a personal opinion, but of the most positive character, that in case of the dissolution of the Clayton-Bulwer treaty, the Bay Islands would not be relinquished by Her Majesty's Government. I felt bound to make this statement, having observed in some quarters an impression that Her Majesty's Government might be disposed not only to annul the treaty, thus opening a path for the eventual annexation of the Isthmus to the Federal Union, but to give up the Bay Islands as well; a notion altogether unfounded in any intimation which has hitherto reached me from the foreign office, and which could not be reconciled in my opinion to the interests of England.

In reply to my observations the Secretary of State remarked that he would reserve the subject for the consideration of his government. He added, as a personal impression, that he was in favor of a naked, unqualified repeal of the Clayton-Bulwer treaty without conditions, and that such a repeal should be effected in the form of a treaty, though he alluded, with a certain deprecation, to the contingency of the dissolution of the treaty by an act of Congress. He also thought, however, that the matters at issue might be adjusted through the mission of Sir William Ouseley.

I was most careful to remark throughout that the opinions I enunciated with reference to the conditions under which the treaty should be abrogated were exclusively my own; and that it belonged to the Government of the United States to offer a suggestion for the purpose in question, as the overture should proceed from them. The only point on which I spoke with determination was that of the surrender of the Bay Islands, in which I trust that I have not misinterpreted the senti-

ments of Her Majesty's Government. On the whole, I did not think that my informal communication was as favorably received as the previous declarations of the President and the Secretary of State on this subject might have warranted me in expecting.

I have, &c.,

NAPIER.

The EARL OF MALMESBURY.

55.—*Lord Malmesbury to Lord Napier.*

No. 58.] FOREIGN OFFICE, *April* 8, 1858.

MY LORD: I have received your lordship's dispatch of the 22d ultimo, reporting your conversation with General Cass upon the disposition of Her Majesty's Government to concur in a proposal to set aside the Clayton-Bulwer treaty, and I have to acquaint your lordship that Her Majesty's Government entirely approve of your having placed on record, by delivering to General Cass copies of those dispatches, that they were ready to abrogate that treaty.

In this state of things it will be proper that your lordship should abstain from any further discussion on that point, leaving the Government of the United States to appreciate as they may the announcement which you have thus made of the readiness of Her Majesty's Government to concur with the view of the subject expressed in the President's message; and your lordship, without further adverting to the question of abrogation, will only press for an early and decided answer to the proposal respecting arbitration which you have submitted to the Government of the United States. You will evince no eagerness for the acceptance of that proposal; neither will you exhibit anxiety for the abrogation of the treaty; and if the proposal is rejected you will not officially bring forward as the alternative the abrogation of the Clayton treaty, but announce your intention to report home and wait for instructions.

Her Majesty's Government, if the initiative is still left to them by the unwillingness of the United States themselves to propose abrogation, desire to retain full liberty as to the manner and form in which any such proposal shall be laid on their behalf before the cabinet at Washington; but, without pronouncing any decided opinion at the present moment, I think it right to point out to your lordship that the effect of such an article as that suggested in your dispatch as the second might be to perpetuate an entanglement with the Government of the United States, and to place that government in a position to question or control the free action of Her Majesty's Government in everything that relates to Central America. The Clayton-Bulwer treaty has been a source of unceasing embarrassment to this country and Her Majesty's Government, if they should be so fortunate as to extricate themselves from the difficulties which have resulted from it, will not involve themselves, directly or indirectly, in any similar difficulties for the future.

Her Majesty's Government would have no objection to enter with the United States into a self-denying engagement, such as that suggested in your first article, by which both parties should renounce all exclusive advantage in the use of any of the interoceanic routes, and should bind themselves each to the other, not to interfere with free transit. Such an article would be a suitable substitute for the Clayton-Bulwer treaty,

for it would secure, as regards the contracting parties, the avowed object of that treaty—the freedom of interoceanic communication.

But beyond this Her Majesty's Government, as at present advised, are not prepared to contract any engagement as a substitute for the Clayton-Bulwer treaty, and from the abrogation of that compact, if it should take place, they will hold themselves as free to act in regard to Central America in the manner most conducive to the advancement of British interests and the fulfillment of British obligations as if the treaty had never been concluded.

Your lordship was, therefore, perfectly right in using decided language, such as that reported in your dispatch respecting the Bay Islands, and whenever the subject of the abrogation of the Clayton-Bulwer treaty is mooted in your presence, you will make it perfectly clear to the Government of the United States that to abrogate the treaty is to return to the *status quo ante* its conclusion in 1850; that Her Majesty's Government have no kind of jealousy respecting American colonization in Central America, which, indeed, it would help to civilize; and that we neither ask nor wish for any exclusive privileges whatever in those regions.

I am, &c.

MALMESBURY.

Lord NAPIER.

56.—*Mr. Cass to Mr. Lamar.*

[Extract.]

No. 9.] DEPARTMENT OF STATE,
Washington, July 25, 1858.

SIR: * * * These great avenues of inter-communication are vastly interesting to all commercial powers, and all may well join in securing their freedom and use against those dangers to which they are exposed from aggressions or outrages, originating within or without the territories through which they pass.

But the establishment of a political protectorate by any of the powers of Europe over any of the independent States of this continent, or, in other words, the introduction of a scheme or policy which would carry with it a right to interfere in their concerns, is a measure to which the United States have long since avowed their opposition, and which, should the attempt be made, they will resist by all the means in their power.

The reasons for the attitude they have assumed have been fully promulgated, and are everywhere well known. There is no need upon this occasion to recapitulate them. They are founded on the political circumstances of the American Continent, which has interests of its own, and ought to have a policy of its own, disconnected from many of the questions which are continually presenting themselves in Europe, concerning the balance of power, and other subjects of controversy arising out of the condition of its States, and which often find their solution or their postponement in war. It is of paramount importance to the States of this hemisphere that they should have no entangling union with the powers of the Old World; a connection which would almost necessarily make them parties to wars having no interest in them, and which would often involve them in hostilities with the other American States, contiguous or remote. The years which have passed by since this principle of separation was first announced by the United States have served still

more to satisfy the people of this country of its wisdom and to fortify their resolution to maintain it happen what may.

The progress of events has rendered the interoceanic routes across the narrow portions of Central America vastly important to the commercial world, and especially to the United States, whose possessions extending along the Atlantic and Pacific coasts demand the speediest and easiest modes of communication. While the just rights of sovereignty of the States occupying this region should always be respected, we shall expect that these rights will be exercised in a spirit befitting the occasion and the wants and circumstances that have arisen. Sovereignty has its duties as well as its rights, and none of these local governments, even if administered with more regard to the just demands of other nations than they have been, would be permitted, in a spirit of Eastern isolation, to close these gates of intercourse on the great highways of the world, and justify the act by the pretension that these avenues of trade and travel belong to them, and that they choose to shut them, or, what is almost equivalent, to encumber them with such unjust regulations as would prevent their general use. The United States do not seek either the control or the exclusive use of these routes. They desire that the advantages should be equally common to all nations. Nor do they claim to interfere with the local governments in the determination of the questions connected with the opening of the routes, and with the persons with whom contracts may be made for that purpose. What they do desire, and mean to accomplish, is that the great interests involved in this subject should not be sacrificed to any unworthy motive, but should be guarded from abuse, and that when fair contracts are fairly entered into with American citizens, they should not be wantonly violated.

Other nations will no doubt pursue the same course in relation to their citizens or subjects who may have similar interests.

But besides these general considerations applicable to this subject, there are others which impose additional obligations upon these Isthmian Powers, and which bear with equal force upon their relations with other nations. Several of these powers, and Nicaragua especially, have in fact, by their public proceedings invited the co-operation of the capital, and industry, and enterprise of the world in order to open these lines of communication. The citizens of the United States have contributed their full share towards the accomplishment of the enterprise, and this government intends to use the means in its power to protect them in the enjoyment of their rights. The good faith of Nicaragua has been committed, and large sums have been expended looking to its faithful observance.

A paper has recently appeared in the public journals, to which I have already referred, purporting to be a contract between the governments—the Presidents rather—of Costa Rica and of Nicaragua and M. Belly, a French citizen, and his associates, constituting a new canal-route company, and providing for its operations. Nothing is known here officially of the authenticity of this paper, but it carries with it a strong probability that it is genuine, and presuming it to be so it furnishes you with an occasion to lay before these governments the views of the United States respecting their own interests and the interests of their citizens involved in the contracts for opening transit routes. So far as regards the action of Costa Rica, the President adheres to the views laid down in the instructions to our special agent, Mr. Jones, a copy of which has been communicated to those governments, and also furnished to yourself. And the United States, while they interpose no objection to an amicable adjustment by those republics of the question of their bound-

ary line, will recognize no arrangement which interferes with the existing transit interests as insisted on in those instructions.

The United States no more claim for their citizens an exclusive right to form contracts for opening these transit routes than they claim for them the exclusive use of the routes when the work is completed. Their construction is a fair object of competition for the citizens and subjects of all other powers. The work is as open to M. Belly and his associates as to any other enterprising person. There are but two points connected with this matter which have any interest for the United States, or which would justify their intervention. The first is, that no contract with M. Belly, or with any one, indeed, should interfere with engagements previously existing with American citizens, but that all such engagements should be preserved inviolate; and the second is, that the regulations and conditions of the grant should be such as to render the routes free and safe to all nations, but controlled by no one, and upon moderate and reasonable terms. It would be equally impolitic and unjust for these governments, in a desire to make those great undertakings profitable to themselves, without furnishing any contribution towards their construction, to levy onerous charges upon the persons and property destined to pass over them, and by this means interpose serious obstacles to their general use. These local governments should look to the vast benefits which these enterprises will bring to the countries through which they pass, and not strive by excessive impositions to make them sources of revenue, and defeat, by this ill-judged measure, the very object sought to be obtained.

It is not necessary that I should enter into a detailed examination of M. Belly's contract. There are physical and financial obstacles, as well as political ones, in the way of its execution, some of which can hardly be overcome. I shall, therefore, only advert to one of the provisions, rather with a view to the future proceedings of these governments than from any practical bearing it will have in this case.

But previously to doing so I will bring to your notice one extraordinary stipulation which it could scarcely have been expected would be acceptable to the United States, and which must have been entered into in the anticipation of their objections to it. Those objections are insurmountable.

This obnoxious arrangement provides that the French Government shall have the right to keep two ships of war stationed in the waters of Lake Nicaragua for the entire duration of the works.

I am persuaded that this proposition will meet no favor from the French Government, and that its name has been introduced here unwarrantably and without its knowledge. The equality and security of these interoceanic routes constitute a great portion of their value to the world, and all commercial powers are interested in their maintenance. An exclusive right in one of these powers to exercise a permanent armed intervention would give serious cause of dissatisfaction to all the others, and the United States freely avow their determination to oppose such a measure should the Governments of Costa Rica and Nicaragua attempt to carry it into effect.

But there are additional conditions applicable to this contract with M. Belly and to other contracts for similar purposes entered into by the Government of Nicaragua which commend themselves to the Government of the United States, and will not be disregarded. There are several American citizens who, with different interests, claim to have formed engagements with the proper authorities of Nicaragua for opening and using the transit routes, with various stipulations defining their

privileges and duties, and some of these contracts have already been in operation. This government has neither the authority nor the disposition to determine the conflicting interests of these claimants; but what it has the right to do, and what it is disposed to do, is to require that the Government of Nicaragua should act in good faith towards them, and should not arbitrarily and wrongfully divest them of rights justly acquired and solemnly guaranteed. The United States believe it to be their duty, and they mean to execute it, to watch over the persons and property of their citizens visiting foreign countries, and to intervene for their protection when such action is justified by existing circumstances and by the law of nations. Wherever their citizens may go through the habitable globe, when they encounter injustice they may appeal to the government of their country, and the appeal will be examined into with a view to such action in their behalf as it may be proper to take. It is impossible to define in advance and with precision those cases in which the national power may be exerted for their relief, or to what extent relief shall be afforded. Circumstances as they arise must prescribe the rule of action. In countries where well-defined and established laws are in operation, and where their administration is committed to able and independent judges, cases will rarely occur where such intervention will be necessary. But these elements of confidence and security are not everywhere found, and where that is unfortunately the case the United States are called upon to be more vigilant in watching over their citizens, and to interpose efficiently for their protection when they are subjected to tortious proceedings, by the direct action of the government, or by its indisposition or inability to discharge its duties.

But there is yet another consideration which calls for the attention of this government. These contracts with their citizens have a national importance. They affect not ordinary interests merely, but questions of great value, political, commercial, and social, and the United States are fully justified by the considerations already adverted to in taking care that they are not wantonly violated, and the safe establishment of an interoceanic communication put to hazard or indefinitely postponed. The course of the Government of Nicaragua with relation to these engagements contains nothing in it reassuring, for the future contracts duly executed with all the forms of law, carrying with them important vested rights, have been arbitrarily set aside by executive decrees—a mode of proceeding not recognized in the contracts themselves—and without resorting to the action of judicial tribunals. The facts in dispute have been unjustly assumed, and the hand of violence has been laid upon solemn engagements which ought to have found their security in the good faith of the government. I am not aware that in any case has the forfeitnre of a contract been declared in any other way than by an arbitrary executive decree. This is a state of things to which no nation is bound to submit. It is vain to expect that the means of men and money required from other nations for the execution of these works will be furnished in the face of such manifestations of bad faith. Without confidence these great enterprises must fail; nor is it probable that one of them requiring a heavy outlay would now be undertaken and completed without some surer guarantee for their protection than would be furnished by the engagements of these Central American States. The danger of violation is too well known and appreciated to justify the expectation of the investment of capital under such unpropitious circumstances.

So long as a pecuniary object is supposed to furnish a motive for re-

scinding existing contracts and forming new ones, without any regard to vested rights, no progress will be made in the construction of canals or of other permanent and expensive works for transportation.

The United States, acting in behalf of their citizens, object to this system of confiscation, and they do not doubt but that they will have the concurrence of all other powers who have similar interests in these vastly important measures. What the United States demand is, that in all cases where their citizens have entered into contracts with the proper Nicaraguan authorities, and questions have arisen, or shall arise, respecting the fidelity of their execution, no declaration of forfeiture, either past or to come, shall possess any binding force unless pronounced in conformity with the provisions of the contract, if there are any, or if there is no provision for that purpose, then unless there has been a fair and impartial investigation in such a manner as to satisfy the United States that the proceeding has been just and that the decision ought to be submitted to.

Without some security of this kind, this government will consider itself warranted, whenever a proper case arises, in interposing such means as it may think justifiable, in behalf of its citizens who may have been or who may be injured by such unjust assumption of power.

* * * * * * *

I am, &c.,

LEWIS CASS.

57.—*Mr. Cass to Lord Napier.*

DEPARTMENT OF STATE,
Washington, November 8, 1858.

MY LORD: I have had the honor to receive the copy which your lordship did me the favor to send me of Lord Malmesbury's dispatch to your lordship of August 18, in reference to Sir William Ouseley's mission, and have submitted it to the consideration of the President. From the statement of Lord Malmesbury that the British Government has no remaining alternative but that of "leaving the Cabinet of Washington to originate any further overtures for an adjustment of these controversies," it is quite obvious that the position of the President on this subject is not correctly understood by Her Majesty's Government. Since the announcement by your lordship in October, 1857, of Sir William Ouseley's special mission, the President has awaited not so much any new proposition for the adjustment of the Central American questions as the statement in detail which he had been led to expect of the method by which Sir William Ouseley was to carry into effect the previous proposition of the British Government. To make this plain, your lordship will pardon me for making a brief reference to what has occured between the two governments in respect to Central America since the ratification of the Clayton-Bulwer treaty of 1850.

While the declared object of that convention had reference to the construction of a ship-canal, by the way of San Juan and the lakes of Nicaragua and Managua, from the Atlantic to the Pacific Oceans, yet it avowed none the less plainly a general principle in reference to all practicable communications across the isthmus, and laid down a distinct policy by which the practical operation of this principle was likely to be kept free from all embarrassment. The principle was that the interoceanic routes should remain under the sovereignty of the states through which

they ran, and be neutral and free to all nations alike. The policy was, that in order to prevent any government outside of those states from obtaining undue control or influence over these interoceanic transits, no such nation should "erect or maintain any fortifications commanding the same, or in vicinity thereof, or should occupy or fortify or colonize or assume or exercise any dominion over Nicaragua, Costa Rica, the Mosquito coast, or any part of Central America."

So far as the United States and Great Britain were concerned, these stipulations were expressed in unmistakable terms, and in reference to other nations it was declared that the contracting parties in this convention engage to invite every state with which both or either have friendly intercourse to enter into stipulations with them similar to those which they have entered into with each other. At that time the United States had no possessions whatever in Central America and exercised no dominion there. In respect to this government, therefore, the provisions of the first article of the treaty could operate only as a restriction for the future, but Great Britain was in the actual exercise of dominion over nearly the whole eastern coast of that country, and in relation to her this article had a present as well as a prospective operation. She was to abandon the occupancy which she already had in Central America, and was neither to make acquisitions or erect fortifications or exercise dominion there in the future. In other words, she was to place herself in the same position, with respect to possessions and dominion in Central America, which was to be occupied by the United States, and which both the contracting parties to the treaty engaged that they would endeavor to induce other nations to occupy. This was the treaty as it was understood and assented to by the United States, and this is the treaty as it is still understood by this government. Instead, however, of giving effect to it in this sense, the British Government proceeded in 1851, only a few months after the signature of the treaty, to establish a new British colony in Central America under the name of the "Bay Islands"; and when this government expressed its great surprise at this proceeding and at the failure of Great Britain to comply with the terms of the convention, Her Majesty's Government replied that the Islands already belonged to Great Britain at the date of the treaty, and that the convention, in their view of it, interfered with none of their existing possessions in Central America, but was wholly prospective in its character and only prevented them from making new acquisitions. It is unnecessary to do more than simply refer to the earnest and able discussions which followed this avowal, and which show more and more plainly the opposite constructions which were placed upon the treaty by the two governments.

In 1854 it was sought to reconcile these constructions and to terminate the Central American questions by the convention which was signed at London by the American minister and Lord Clarendon, usually designated the Dallas-Clarendon treaty. The terms of this treaty are, doubtless, familiar to your lordship.

It provides—

1. For the withdrawal of the British protectorate over the Mosquito Indians, and for an arrangement in their behalf upon principles which were quite acceptable to the United States.

2. It regulated the boundaries of the Belize settlements within which Great Britain claimed to exercise certain possessory rights upon terms which, although not wholly acceptable to this government, were yet in a spirit of generous concession ratified by the United States Senate.

3. It provided for a cession of the Bay Islands to Honduras (in the

opinion of this government their rightful proprietor), but this concession was made dependent upon an unratified treaty between Great Britain and Honduras, whose terms were not officially known to this government, but which, so far as they had unofficially appeared, were not of a satisfactory character.

The Senate, therefore, in ratifying the Dallas-Clarendon treaty, felt obliged to amend it by striking out all that part of it which contemplated the concurrence of this government in the treaty with Honduras, and simply providing for a recognition by the two governments of the sovereign right of Honduras to the islands in question. Great Britain found itself unable to concur in this amendment, and the Dallas-Clarendon treaty, therefore, fell to the ground. It was clear, however, that the objections of the Senate to the Honduras treaty were not deemed unreasonable by Her Majesty's Government, because, in your lordship's interview with the President on the 22d October, 1857, your lordship "allowed that the articles establishing the administrative independence of the islands might have been larger than was necessary." "I had observed," you added, "the same impression in the correspondence of Mr. Wyke, Her Majesty's chargé d'affaires at Guatemala, who seemed to admit that a greater participation in the internal government might be granted to the authorities of Honduras," and you made "no doubt that Her Majesty's Government would entertain any reasonable suggestions which might be offered to them in that sense."

And again, in your lordship's note to this department of November 30, 1857, you recognize the same probability "that the intervention of the Honduras Government in the administration of the islands may have been more limited than was necessary or even advisable."

Such was doubtless the opinion of Honduras, for as long ago as May 10, 1857, I was informed by your lordship that the treaty remained unratified "owing to some objections on the part of the government of Honduras," and that "Her Majesty's Government does not expect that the treaty in its present shape will be definitely sanctioned by that republic."

In view of the objectionable provisions of this convention with Honduras, and of its failure to be sanctioned by that republic, your lordship, by the authority of Lord Clarendon, informed me on the 6th of May, 1857, that Her Majesty's Government was prepared to sanction a new treaty, in respect to the Central American questions, which should in all respects conform to the Dallas-Clarendon treaty, as ratified by the Senate, except that to the simple recognition in the Senate's substitute for the second separate article of the sovereignty of Honduras over the Bay Islands there was to be added the following passage: "Whenever and so soon as the Republic of Honduras shall have concluded and ratified a treaty with Great Britain by which Great Britain shall have ceded and the Republic of Honduras shall have accepted the said islands subject to the provisions and conditions contained in said treaty." While this condition contemplated a new treaty with Honduras which might possibly avoid the objectionable provisions of the old one, yet it was quite impossible for the United States to become a party, either directly or indirectly, to a convention which was not in existence, or whose terms and conditions it could neither know nor control. For this reason I informed your lordship in my communication of May 29 that your lordship's proposition was declined by this government.

The attempts to adjust the Central American questions by means of a supplementary treaty having thus failed of success, and the subject not being of a character, in the opinion of the United States, to admit of

their reference to arbitration, the two governments were thrown back upon their respective rights under the Clayton-Bulwer treaty. While each government, however, had continued to insist upon its own construction of this treaty, there was reason to believe that the embarrassments growing out of their conflicting views of its provisions might be practically relieved by direct negotiations between Her Majesty's Government and the states of Central America.

In this way it seemed possible that, without any injustice to those states, the treaty might be rendered acceptable to both countries as well as operative for the disinterested and useful purposes which it had been designed to serve. The President, therefore, was glad to learn from your lordship, on the 19th of October, 1857, that Her Majesty's Government had "resolved to dispatch a representative of authority and experience to Central America, to make a definitive settlement of all the matters with regard to which the United States and England were still at variance, and who would be instructed," as your lordship believed, "to carry the Clayton Bulwer treaty into execution according to the general tenor of the interpretation put upon it by the United States, but to do so by separate negotiation with the Central American republics in lieu of a direct engagement with the Federal Government." This announcement could not fail to be received with satisfaction by the President, because it contemplated the substantial accomplishment of the very purposes in respect to the treaty which the United States had always had in view, and so long as these were accomplished he assured your lordship that "to him it was indifferent whether the concession contemplated by Her Majesty's Government were consigned to a direct engagement between England and the United States or to treaties between the former and the Central American republics; the latter method might, in some respects," he added, "be even more agreeable to him, and he thought it would be more convenient to Her Majesty's Government, who might, with greater facility, accede to the claims of the weaker party."

It is unnecessary to refer at length to what was said in this conversation, or to a second one on the same subject which your lordship had with the President on the evening of October 23; but there can be no doubt that in both interviews the expected mission of Sir William Ouseley (who it was understood had been selected as the plenipotentiary referred to), in connection with what your lordship indicated as his probable instructions, was favorably regarded by the President. So much was this the case, that he gave your lordship his full assurance that should your lordship's announcement be confirmed by any official information such as he could use, he would change that part of his message which related to Great Britain, would encourage no attempt in Congress to annul the treaty while the mission was in progress, and nothing would give him greater pleasure, he said, "than to add the expression of his sincere and ardent wish for the maintenance of friendly relations between the two countries."

At the close of the second interview, he even went so far as to remark, in reference to the extended boundary claimed by Great Britain for the Belize (to which he had ever objected), that he could take no absolute engagement in this matter; but he would say this much, "that if the Bay Islands were fairly and handsomely evacuated, such a measure would have a great effect with him, and with the American people, in regard to the settlement of the other points at issue."

Sir William Ouseley arrived in Washington about the middle of No-

vember, and on the 30th of November I received from your lordship an official statement in outline of the purposes of his mission.

On the 5th December, your lordship inclosed to me a copy of Lord Clarendon's dispatch of November 20, in which your lordship's previous statement was substantially confirmed, and in which it was further stated that "Sir William Ouseley, during his visit to Washington, will, in pursuance of his instructions, have explained with the utmost frankness to the Government of the United States the nature of the instructions with which he is furnished, and your lordship, as the duly accredited organ of Her Majesty's Government, will have given similar explanations."

The objects of Sir William Ouseley's mission, as thus made known to the United States, were:

1. To provide for the transfer by Great Britain of the Bay Islands to the Government of Honduras; and in this transfer it was especially declared that the stipulations in the British treaty with Honduras were not to be rigidly adhered to. Sir William Ouseley, on the contrary, while requiring provisions to secure the vested rights of British subjects in the Bay Islands, was to be left at liberty to contract engagements with Honduras which should embody not only an unmistakable recognition of its sovereignty over these islands, but should allow of a more direct government and a more efficient protection over them by that republic than had been contained in the convention of 1856.

2. The second object of Sir William Ouseley's mission was the settlement of the question of the Mosquito protectorate with Nicaragua and Honduras. Whilst he was to provide for the compensation, the government, and the protection of the Mosquito Indians under the sovereignty of Nicaragua, this was to be done upon terms not less favorable than those which had received the approbation of the Senate in the Dallas-Clarendon treaty. In no degree was the Indian reserve to trespass on the territory applicable to transit purposes.

3. The regulation of the frontier of British Honduras was to be effected by negotiation with the Government of Guatemala. Her Majesty's Government trusted to obtain from that republic a recognition of limits "which, if we may judge from previous communications on the subject, may be accepted in a spirit of conciliation, if not with absolute approval, by the President."

Such were the overtures communicated by your lordship's note to this Department of November 30, and which were again referred to in Lord Clarendon's note to your lordship of November 20, of which you inclosed to me a copy in your lordship's note of December 5. Inasmuch as the announcement of Sir William Ouseley's mission, with the explanation by your lordship of its general purposes, had been received with much satisfaction by the President, there were some expressions in this note of Lord Clarendon's which it was not easy to understand; but which, nevertheless, did not materially change the general character of the overtures. It was still stated in that dispatch "that the objections entertained in the United States to the construction placed upon that treaty by the British Government are, as every impartial person must admit, in a fair way to be removed by the voluntary act of the latter; and while the objects of Sir William's mission continued to be mentioned in only general terms, it was yet added that during his visit to Washington he will, in pursuance of his instructions, have explained with the utmost frankness the nature of the instructions with which he is furnished, and your lordship, as the duly accredited organ of Her Majesty in the United States, will have given similar explanations."

The President did not hesitate, therefore, in his message to Congress, to refer to these overtures as having recently been made by the British Government in a friendly spirit, which he cordially reciprocated. He could do no more than this, whatever might be his hopes for the success of Sir William's mission, until he had received the further explanations concerning it which he had been led to expect, and which he was prepared to consider in the kindest and most respectful manner. The general remarks contained in the outline of November 30 must have been molded into some specific form, in order to enable this government to arrive at a practical decision upon the questions presented to it. This I understood to be the view of your lordship and Sir William Ouseley, as well as that of the President and this Department. Indeed, it was wholly in conformity with this view that Sir William Ouseley was understood to have called at Washington on his way to Central America. Had he proceeded directly to his destination, and there, by separate treaties with the Central American republics, given substantial effect to the Clayton-Bulwer convention, according to the general tenor of the American construction of that instrument, the Central American controversy would then have been fortunately terminated to the satisfaction of both governments. But since this government, in a spirit of comity, which the President fully appreciates, was asked to co-operate in accomplishing this result, it was surely not unreasonable that it should know specifically the arrangements which it was expected to sanction.

The general objects in view, we were acquainted with and approved, but there was no draft of a treaty, no form of separate article, no definition of measures. The Bay Islands were to be surrendered, but under what restrictions? The Dallas-Clarendon treaty was to be modified, but what were the modifications? The rights of British subjects and the interests of British trade were to be protected in Ruatan, but to what extent and by what conditions? Honduras was to participate more largely in the government of the Bay Islands than she was allowed to do by the convention of 1856, but how far was she to be restrained and what was to be her power?

These and other similar questions naturally arose upon the general overtures contained in your lordship's note of November 30, and seemed naturally enough to justify the hope which was entertained of some further explanation of these overtures. In all my conversations with your lordship on the subject of Sir William's mission, subsequent to the meeting of Congress, this expectation of some further and more definite communication concerning it was certainly taken for granted, and until time was given to receive such a communication, you did not press for any answer to your lordship's note of November 30. In the beginning your lordship seemed to think that some embarrassment or delay in prosecuting the mission might be occasioned by the expedition to Nicaragua which had been undertaken by General Walker, and by the Cass-Yrisarri treaty which had been negotiated with that republic by the United States; but the treaty was not disapproved by Her Majesty's Government and the expedition of Walker was promptly repressed, so that no embarrassment from these sources could be further apprehended. As the delay still continued, it was suggested by your lordship, and fully appreciated by me, that Her Majesty's Government was necessarily occupied with the affairs of Her Majesty's possessions in India, which then claimed its immediate attention to the exclusion naturally of business which was less pressing, and hence I awaited the expected instructions without any anxiety whatever. All this is precisely what your lordship very frankly describes in your lordship's communication to this

Department of April 12, 1858. "I addressed my government," your lordship says, "with a view to obtaining further explanations and instructions, and I informed you that it was not my desire to press for an official reply to the overtures of the Earl of Clarendon pending an answer from London."

The explanations, however, anticipated by your lordship and by myself were not received, and about three months after the arrival of Sir William at Washington you expressed to me your regret that you had held out expectations which proved unfounded and which had prompted delay, and then for the first time requested an answer to the proposals of Her Majesty's Government, and "especially to that part of them relating to arbitration." It was even then suggested that the answer was desired because it was thought to beappropriate as a matter of form and not because the explanations which had been waited for were deemed wholly unnecessary. "I overlooked something due to forms," is your lordship's language in the note of April 12, "in my anxiety to promote a clearer understanding, and I eventually learned in an official shape that Her Majesty's Government, following their better judgment, desired, before making any further communication, a reply to their overtures, and especially to that part of them referring to arbitration. Should the new proffer of arbitration be declined, it was clearly not supposed in your note of February 15 that this result would have any tendency to interrupt Sir William's efforts; but in that event it was hoped," you informed me, that these efforts "would result in a settlement agreeable to the United States, inasmuch as in essential points it would carry the treaty of 1850 into operation in a manner practically conformable to the American interpretation of that instrument."

On the 6th of April I replied to your lordship's note of February 15, with a very frank and full statement of the views of this government upon all the points to which your lordship had referred. The renewed offer of arbitration mentioned in a dispatch of Lord Clarendon was explicitly declined for the same reasons which had occasioned its rejection before, but an earnest hope was expressed for the success of Sir William Ouseley's mission, and I was instructed formally to request from your lordship those further explanations concerning it, which had been promised in Lord Clarendon's note of November 20, for which both your lordship and myself had waited for three months in vain, and which, up to this time, have never been furnished to the American Government. The disappointment which the President felt at some portions of the correspondence which had occurred, and especially at the failure of Her Majesty's Government to inform him more fully than it had done, on the subject of the mission, was communicated to your lordship without the least reserve, but in the purposes of that mission, so far as he understood them, I was authorized to say that he fully concurred, and to add his sincere hope that they might be successfully accomplished.

"The President," I informed you, "has expressed his entire concurrence in the proposal for an adjustment of the Central American questions, which was made to him by your lordship last October, and he does not wish that any delay or defeat of that adjustment shall be justly chargeable to this government. Since, however, he is asked to co-operate in the arrangement by which it is expected to accomplish it, it is essential that he should know with reasonable accuracy what those arrangements are." It was in the hope of this adjustment, as well as with a view to the serious consequences which might flow from a naked repeal of the Clayton-Bulwer treaty, that I made the observations on that subject which are contained in my letter to your lordship of April 6. No de-

mand for this abrogation, your lordship is well aware, had then been made by Her Majesty's Government; but your lordship had several times suggested to me that such an alternative, if proposed by the United States, would be respectfully considered by Great Britain, and in your lordship's belief might in some form or other be finally adopted. You informed me, however, at the same time that in that event Great Britain would not be inclined to surrender its possessions in Central America, and would certainly continue to occupy the Bay Islands. In reply to this announcement, I informed your lordship that since it is well known that the views of this government are wholly inconsistent with these pretensions, and that it can never willingly acquiesce in their maintenance by Great Britain, your lordship will readily perceive what serious consequences might follow a dissolution of the treaty, if no provision should be made at the same time for adjusting the questions which led to it.

"If, therefore," I added, "the President does not hasten to consider now the alternative of repealing the treaty of 1850, it is because he does not wish to anticipate the failure of Sir William Ouseley's mission, and is disposed to give a new proof to Her Majesty's Government of his sincere desire to preserve the amicable relations which now happily subsist between the two countries."

Having thus complied with your lordship's request, and given that formal reply to the overtures embraced in Sir William Ouseley's mission which was desired by Her Majesty's Government, I confidently expected to receive within a reasonable time these additional instructions which appeared to have been delayed for this reply. Such, doubtless, was the hope, also, of your lordship. "The discussion has been deferred," you informed me in your note of April 12, "but the interests at stake have probably not suffered." The results of the negotiation between Nicaragua and the United States are not yet disclosed, and it is probable that Sir William Ouseley may proceed to his destination with more advantage when the nature of those engagements is fully defined." "If the American Cabinet," you also said, "as may be inferred from your expressions, be well disposed toward Sir William Ouseley's mission, and will meet her Majesty's Government in a liberal spirit on matters of secondary moment, that mission may still conduct us to a happy termination." In further informing me that my communication would be transmitted to Her Majesty's Government, you added, "It remains with Her Majesty's Government to determine whether they can afford the more perfect information desired."

This was the state of the negotiation in April, 1858. The purposes of Sir William Ouseley's mission had been announced to the American Government and approved; reference had been made by Lord Clarendon to your lordship and Sir William Ouseley for further explanations; these explanations had been asked for from your lordship in repeated interviews, but your lordship had not received the necessary instructions to make them until a reply had been received to the general overtures embraced in your previous notes, and especially to that part of them relating to arbitration; this reply had been given, still approving the mission and rejecting the arbitration; and it had been sent to London for the consideration of Her Majesty's Government.

Under these circumstances, I need not describe to your lordship the surprise with which I received the copy of Lord Malmesbury's dispatch to your lordship, dated at Potsdam, August 18, which you were good enough to inclose to me. In this dispatch, instead of affording any more exact definition of the objects of Sir William Ouseley's mission, your

lordship is directed to inform me that Her Majesty's Government "have, in fact, nothing to add to the explanations given by Sir William and your lordship upon the subject." As no explanations whatever had been received from either Sir William or yourself since the communication of November 30, it is obvious that his lordship must labor under some misapprehension on this subject; and equally clear is it that when his lordship represents me as having declared in my note of the 6th of April that the Government of the United States could not agree to the abrogation of the Clayton-Bulwer treaty, that he has failed to appreciate fully the views of the United States in reference to that abrogation. The declaration in my note of April 6 was certainly not against any abrogation of the treaty, but against considering the expediency of abrogating it at that particular time, and until hopes were at an end for a successful termination of Sir William Ouseley's mission. This waiver of a discussion on the subject of abrogation, in deference to the purposes of that mission, indicated very clearly, it seems to me, how much was expected by this government from Sir William Ouseley's mission. Yet even these efforts Lord Malmesbury seems to regard as having been rejected by the United States, and Her Majesty's Government, he concludes, have no alternative but that of leaving to the Cabinet of Washington to originate any further overtures for an adjustment of these controversies.

Surely, my lord, there must be some grave misapprehension in all this of the views entertained and expressed by this government upon the proposals embraced in your lordship's note of November 30, or else this government has labored under an equally serious error as to what was intended by Sir William Ouseley's mission. It is under this impression, and in order to prevent two great nations from failing in their attempts to adjust an important controversy from a mere question of form, or a mere misunderstanding of each other's views, that I have entered into this extended narrative. It is of no small consequence, either to the United States or Great Britain, that these Central American controversies between the two countries should be forever closed.

On some points of them, and I have been led to hope on the general policy which ought to apply to the whole Isthmian region, they have reached a commond ground of agreement.

The neutrality of the interoceanic routes and their freedom from the superior and controlling influence of any one government, the principles upon which the Mosquito protectorate may be arranged, with justice alike to the sovereignty of Nicaragua and the Indian tribes, the surrender of the Bay Islands under certain stipulations for the benefit of trade and the protection of their British occupants, and the definition of the boundaries of the British Belize—about all these points there is no apparent disagreement except as to the conditions which shall be annexed to the Bay Islands' surrender, and as to the limits which shall be fixed to the settlements of the Belize. Is it possible that, if approached in a spirit of conciliation and good feeling, these two points of difference are not susceptible of a friendly adjustment? To believe this would be to underestimate the importance of the adjustment, and the intelligent appreciation of this importance which must be entertained by both nations.

What the United States want in Central America, next to the happiness of its people, is the security and neutrality of the interoceanic routes which lead through it. This is equally the desire of Great Britain, of France, and of the whole commercial world. If the principles and policy of the Clayton-Bulwer treaty are carried into effect, this ob-

ject is accomplished. When, therefore, Lord Malmesbury invites new overtures from this government upon the idea that it has rejected the proposal embraced in Sir William Ouseley's mission for an adjustment of the Central American questions by separate treaties with Honduras, Nicaragua, and Guatemala, upon terms substantially according with the general tenor of the American interpretation of the treaty, I have to reply that this very adjustment is all that the President ever desired, and that instead of having rejected that proposal he had expressed his cordial acceptance of it so far as he understood it, and had anticipated from it the most gratifying consequences.

Nothing now remains for me but to inquire of your lordship whether the overtures contained in your lordship's note of November 30, are to be considered as withdrawn by Her Majesty's Government, or whether the good results expected in the beginning from Sir William Ouseley's mission may not yet be happily accomplished.

I have, &c.,

LEWIS CASS.

58.—*Lord Malmesbury to Lord Napier.*

[Extract.]

FOREIGN OFFICE, *December* 8, 1858.

MY LORD: I have to inform your lordship that Her Majesty's Government have received with lively satisfaction the note which General Cass addressed to your lordship on the 8th of November. The friendly tone in which it is written, and the high appreciation which it displays of the importance of terminating the irritating discussions in which both our countries have been so long involved, cannot but tend to render that termination near at hand and permanent.

I feel it to be a duty to do justice to the accuracy with which General Cass has recapitulated the circumstances under which the controversy has been sustained, and the efforts hitherto employed to settle it have failed.

* * * * * * *

I am, &c.,

MALMESBURY.

59.—*Convention between Great Britain and Guatemala. Signed at Guatemala April* 30, 1859.

Whereas the boundary between Her Britannic Majesty's settlement and possessions in the Bay of Honduras and the territories of the Republic of Guatemala has not yet been ascertained and marked out; Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, and the Republic of Guatemala, being desirous, with a view to improve and perpetuate the friendly relations which happily subsist between the two countries, to define the boundary aforesaid have resolved to conclude a convention for that purpose, and have named as their plenipotentiaries, that is to say:

Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, Charles Lennox Wyke, esquire, Her Britannic Majesty's chargé d'affaires to the Republic of Guatemala, and his excellency the President of the Republic of Guatemala, Don Pedro de Aycinena, councillor of state and minister for foreign affairs;

Who, after having communicated to each other their respective full powers, found in good and due form, have agreed upon and concluded the following articles:

ART. I. It is agreed between Her Britannic Majesty and the Republic of Guatemala, that the boundary between the republic and the British settlement and possessions in the Bay of Honduras, as they existed previous to and on the 1st day of January, 1850, and have continued to exist up to the present time, was and is as follows:

Beginning at the mouth of the River Sarstoon, in the Bay of Honduras, and proceeding up the mid-channel thereof to Gracias á Dios Falls; then turning to the right and continuing by a line drawn direct from Gracias á Dios Falls to Garbutt's Falls, on the River Belize, and from Garbutt's Falls due north until it strikes the Mexican frontier.

It is agreed and declared between the High Contracting Parties that all the territory to the north and east of the line of boundary above described belongs to Her Britannic Majesty; and that all the territory to the south and west of the same belongs to the Republic of Guatemala.

ART. II. Her Britannic Majesty and the Republic of Guatemala shall, within 12 months after the exchange of the ratifications of the present convention, appoint each a commissioner for the purpose of designating and marking out the boundary described in the preceding article. Such commissioners shall ascertain the latitude and longitude of Gracias á Dios Falls and of Garbutt's Falls, and shall cause the line of boundary between Garbutt's Falls and the Mexican territory to be opened and marked where necessary, as a protection against future trespass.

ART. III. The commissioners mentioned in the preceding article shall meet at such place or places as shall be hereafter fixed, at the earliest convenient period after they shall have been respectively named; and shall, before proceeding to any business, make and subscribe a solemn declaration that they will impartially and carefully examine and decide, to the best of their judgment, and according to justice and equity, without fear, favour, or affection to their own country, upon all the matters referred to them for their decision, and such declaration shall be entered on the record of their proceedings. The commissioners shall then, and before proceeding to any other business, name some third person to act as arbitrator or umpire in any case or cases in which they may themselves differ in opinion. If they should not be able to agree upon the choice of such a third person, they shall each name a person; and in each and every case in which the commissioners may differ in opinion as to the decision which they ought to give, it shall be determined by lot which of the two persons so named shall be the arbitrator or umpire in that particular case. The person or persons so to be chosen shall, before proceeding to act, make and subscribe a solemn declaration, in a form similar to that which shall already have been made and subscribed by the commissioners, which declaration shall also be entered on the record of the proceedings. In the event of the death, absence, or incapacity of either of such commissioners, or of either of such arbitrators or umpires, or of his omitting, or declining, or ceasing to act, another person shall be named, in the same manner, to act in his place or stead, and shall make and subscribe such declaration as aforesaid.

Her Britannic Majesty and the Republic of Guatemala shall engage to consider the decision of the two commissioners conjointly, or of the arbitrator or umpire, as the case may be, as final and conclusive on the matters to be respectively referred to their decision, and forthwith to give full effect to the same.

ART. IV. The commissioners hereinbefore mentioned shall make to each of the respective governments a joint report or declaration, under their hands and seals, accompanied with a map or maps in quadruplicate (two for each government), certified by them to be true maps of the boundary defined in the present treaty, and traversed and examined by them.

ART. V. The commissioners and the arbitrator or umpire shall keep accurate records and correct minutes or notes of all their proceedings, with the dates thereof, and shall appoint and employ such surveyors, clerk or clerks, or other persons as they shall find necessary to assist them in the transaction of the business which may come before them.

The salaries of the commissioners shall be paid by their respective governments. The contingent expenses of the commission, including the salary of the arbitrator or umpire, and of the surveyors and clerks, shall be defrayed in equal moieties by the two governments.

ART. VI. It is further agreed that the channels in the water-line of boundary described in Article I of the present convention shall be equally free and open to the vessels and boats of both parties, and that any islands which may be found therein shall belong to that party on whose side of the main navigable channel they are situated.

ART. VII. With the object of practically carrying out the views set forth in the preamble of the present convention for improving and perpetuating the friendly relations which at present so happily exist between the two High Contracting Parties, they mutually agree conjointly to use their best efforts, by taking adequate means for establishing the easiest communication (either by means of a cart-road or employing the rivers, or both united, according to the opinion of the surveying engineers) between the fittest place on the Atlantic coast, near the settlement of Belize and the capital of Guatemala, whereby the commerce of England on the one hand, and the material prosperity of the Republic on the other, cannot fail to be sensibly increased, at the same time that the limits of the two countries being now clearly defined, all further encroachments by either party on the territory of the other will be effectually checked and prevented for the future.

ART. VIII. The present convention shall be ratified, and the ratifications shall be exchanged at London or Guatemala as soon as possible within the space of 6 months.

In witness whereof, the respective plenipotentiaries have signed the same, and have affixed thereto the seals of their arms.

Done at Guatemala, the 30th day of April, in the year 1859.

[L. S.] CHARLES LENNOX WYKE.
[L. S.] P DE AYCINENA.

60.—*Treaty between Great Britain and Honduras respecting the Bay Islands, the Mosquito Indians, and the rights and claims of British subjects, signed at Comayagua, November* 28, 1859.

Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, and the Republic of Honduras, being desirous to settle in a friendly manner certain questions in which they are mutually interested, have resolved to conclude a Treaty for that purpose, and have named as their Plenipotentiaries, that is to say :

Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, Charles Lennox Wyke, esquire, Companion of the Most Honor-

able Order of the Bath, Her Britannic Majesty's Envoy Extraordinary and Minister Plenipotentiary, on a special mission to the Republics of Central America; and His Excellency the President of the Republic of Honduras, Don Francisco Cruz, Political Chief of the Department of Comayagua.

Who, after having communicated to each other their respective full powers, found in good and due form, have agreed upon and concluded the following articles:

ART. I. Taking into consideration the peculiar geographical position of Honduras, and in order to secure the neutrality of the islands adjacent thereto, with reference to any railway or other line of interoceanic communication which may be constructed across the territory of Honduras on the mainland, Her Britannic Majesty agrees to recognize the Islands of Ruatan, Guanaca, Elena, Utile, Barbarete, and Morat, known as the Bay Islands, and situated in the Bay of Honduras, as a part of the Republic of Honduras.

The inhabitants of the said islands shall not be disturbed in the enjoyment of any property which they may have acquired therein, and shall retain perfect freedom of religious belief and worship, public and private, but remaining in all other respects subject to the laws of the Republic. If any of them should wish to withdraw from the islands, they shall be at full liberty to do so; to dispose of their fixed or other property as they may think fit, and to take with them the proceeds thereof.

The Republic of Honduras engages not to cede the said islands, or any of them, or the right of sovereignty over such islands, or any of them, or any part of such sovereignty, to any nation or state whatsoever.

ART. II. Her Britannic Majesty engages, subject to the conditions and engagements specified in the present Treaty, and without prejudice to any question of boundary between the Republics of Honduras and Nicaragua, to recognize as belonging to and under the sovereignty of the Republic of Honduras the country hitherto occupied or possessed by the Mosquito Indians within the frontier of that Republic, whatever that frontier may be. The British protectorate of that part of the Mosquito territory shall cease 3 months after the exchange of the ratifications of the present treaty, in order to enable Her Majesty's Government to give the necessary instructions for carrying out the stipulations of said treaty.

ART. III. The Mosquito Indians in the district recognized by Article II of this treaty as belonging to and under the sovereignty of the Republic of Honduras shall be at liberty to remove, with their property, from the territory of the Republic, and to proceed whithersoever they may desire, and such of the Mosquito Indians who remain within the said district shall not be disturbed in the possession of any lands or other property which they may hold or occupy, and shall enjoy, as natives of the Republic of Honduras, all rights and privileges enjoyed generally by the natives of the Republic.

The Republic of Honduras being desirous of educating the Mosquito Indians, and improving their social condition in the district so occupied by them, will grant an annual sum of 5,000 dollars, in gold or silver, for the next 10 years for that purpose, to be paid to their headman in the said district, the payment of such annual sum being guaranteed them by a mortgage on all woods and other natural productions (whatever they may be) of the state lands in the Bay Islands and the Mosquito territory. These payments shall be made in half-yearly instalments of 2,500 dollars each, the first of which payments shall be made 6 months after the exchange of the ratifications of the present treaty.

ART. IV. Whereas British subjects have, by grant, lease, or otherwise, heretofore obtained from the Mosquito Indians interests in various lands situated within the district mentioned in the preceding article, the Republic of Honduras engages to respect and maintain such interests; and it is further agreed that Her Britannic Majesty and the Republic shall, within 12 months after the exchange of the ratifications of the present Treaty, appoint two commissioners, one to be named by each party, in order to investigate the claims of British subjects arising out of such grants or leases, or otherwise, and all British subjects whose claims shall, by the commissioners, be pronounced well founded and valid, shall be quieted in the possession of their respective interests in the said lands.

ART. V. It is further agreed between the contracting parties that the commissioners mentioned in the preceding article shall also examine and decide upon any British claims upon the Government of Honduras that may be submitted to them, other than those specified in that article, and not already in a train of settlement; and the Republic of Honduras agrees to carry into effect any agreements for the satisfaction of British claims already made, but not yet carried into effect.

ART. VI. The commissioners mentioned in the preceding articles shall meet in the city of Guatemala, at the earliest convenient period after they shall have been respectively named, and shall, before proceeding to any business, make and subscribe a solemn declaration that they will impartially and carefully examine and decide, to the best of their judgment, and according to justice and equity, without fear, favor, or affection to their own country, all the matters referred to them for their decision, and such declaration shall be entered on the record of their proceedings.

The commissioners shall then, and before proceeding to any other business, name some third person to act as an arbitrator or umpire in any case or cases in which they may themselves differ in opinion. If they should not be able to agree upon the selection of such a person, the commissioner on either side shall name a person; and in each and every case in which the commissioners may differ in opinion as to the decision which they ought to give, it shall be determined by lot which of the two persons so named shall be arbitrator or umpire in that particular case. The person or persons so to be chosen shall, before proceeding to act, make and subscribe a solemn declaration, in a form similar to that which shall already have been made and subscribed by the commissioners, which declaration shall also be entered on the record of the proceedings.

In the event of the death, absence, or incapacity of such person or persons, or of his or their omitting, or declining, or ceasing to act as such arbitrator or umpire, another person or persons shall be named as aforesaid to act as arbitrator or umpire in his or their place or stead, and shall make and subscribe such declaration as aforesaid.

Her Britannic Majesty and the Republic of Honduras hereby engage to consider the decision of the commissioners conjointly, or of the arbitrator or umpire, as the case may be, as final and conclusive on the matters to be referred to their decision; and they further engage forthwith to give full effect to the same.

ART. VII. The commissioners and the arbitrator or umpire shall keep an accurate record and correct minutes or notes of all their proceedings, with the dates thereof, and shall appoint and employ a clerk or other persons to assist them in the transaction of the business which may come before them.

The salaries of the commissioners shall be paid by their respective governments. The contingent expenses of the commission, including the salary of the arbitrator or umpire, and of the clerk or clerks, shall be defrayed in equal halves by the two governments.

ART. VIII. The present Treaty shall be ratified, and the ratifications shall be exchanged at Comayagua as soon as possible within 6 months from this date.

In witness whereof, the respective plenipotentiaries have signed the same, and have affixed thereto their respective seals.

Done at Comayagua the 28th day of November, in the year of our Lord 1859.

[L. S.] C. LENNOX WYKE.
[L. S.] FRANCISCO CRUZ.

61.—*Treaty between Great Britain and Nicaragua relative to the Mosquito Indians and to the rights and claims of British subjects. Signed at Managua January* 28, 1860.

Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, and the Republic of Nicaragua, being desirous to settle in a friendly manner certain questions in which they are mutually interested, have resolved to conclude a Treaty for that purpose, and have named as their plenipotentiaries, that is to say:

Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, Charles Lennox Wyke, esquire, Companion of the Most Honorable Order of the Bath, Her Britannic Majesty's Envoy Extraordinary and Minister Plenipotentiary on a special mission to the Republics of Central America; and his Excellency the President of the Republic of Nicaragua, Don Pedro Zeledon, Minister for Foreign Affairs.

Who, after having communicated to each other their respective full powers, found in good and due form, have agreed upon and concluded the following articles:

ART. I. On exchanging the ratifications of the present Treaty, Her Britannic Majesty, subject to the conditions and engagements specified therein, and without prejudice to any question of boundary between the Republics of Nicaragua and Honduras, will recognize as belonging to and under the sovereignty of the Republic of Nicaragua the country hitherto occupied or claimed by the Mosquito Indians within the frontier of that Republic, whatever that frontier may be.

The British protectorate of that part of the Mosquito territory shall cease three months after the exchange of the ratifications of the present Treaty; in order to enable Her Majesty's Government to give the necessary instructions for carrying out the stipulations of said Treaty.

II. A district within the territory of the Republic of Nicaragua shall be assigned to the Mosquito Indians, which district shall remain, as above stipulated, under the sovereignty of the Republic of Nicaragua. Such district shall be comprised in a line, which shall begin at the mouth of the river Rama, in the Caribbean Sea; thence it shall run up the mid-course of that river to its source, and from such source proceed in a line due west to the meridian of 84° 15′ longitude west from Greenwich; thence due north up the said meridian until it strikes the river Hueso, and down the mid-course of that river to its mouth in the sea, as laid down in Baily's map at about latitude from 14° to 15° north, and longitude 83° west from the meridian of Greenwich; and thence

southerly along the shore of the Caribbean Sea to the mouth of the river Rama, the point of commencement. But the district thus assigned to the Mosquito Indians may not be ceded by them to any foreign person or state, but shall be and remain under the sovereignty of the Republic of Nicaragua.

III. The Mosquito Indians within the district designated in the preceding article shall enjoy the right of governing according to their own customs, and according to any regulations which may from time to time be adopted by them, not inconsistent with the sovereign rights of the Republic of Nicaragua, themselves, and all persons residing within such district. Subject to the above-mentioned reserve, the Republic of Nicaragua agrees to respect and not to interfere with such customs and regulations so established or to be established within the said district.

IV. It is understood, however, that nothing in this treaty shall be construed to prevent the Mosquito Indians at any future time from agreeing to absolute incorporation into the Republic of Nicaragua on the same footing as other citizens of the republic, and from subjecting themselves to be governed by the general laws and regulations of the republic instead of by their customs and regulations.

V. The Republic of Nicaragua, being desirous of promoting the social improvement of the Mosquito Indians, and of providing for the maintenance of the authorities to be constituted under the provisions of Article III of this treaty, in the district assigned to the said Indians, agrees to grant to the said authorities, for the space of 10 years, with a view to such purposes, an annual sum of 5,000 hard dollars. The said sum shall be paid at Greytown, by half-yearly payments, to such persons as may be authorized by the chief of the Mosquito Indians to receive the same, and the first payment shall be made 6 months after the exchange of the ratifications of the present treaty.

For the payment of this sum Nicaragua will levy and especially consign a duty, to be levied according to weight, on all packages of goods that are imported into that port for consumption in the territory of the republic; and in case this duty shall not suffice for the payment of said sum, the deficit shall be made up from the other duties levied in the republic.

VI. Her Britannic Majesty engages to use her good offices with the chief of the Mosquito Indians, so that he shall accept the stipulations which are contained in this convention.

VII. The Republic of Nicaragua shall constitute and declare the port of Greytown, or San Juan del Norte, a free port under the sovereign authority of the republic. But the Republic, taking into consideration the immunities heretofore enjoyed by the inhabitants of Greytown, consents that trial by jury in all cases, civil or criminal, and perfect freedom of religious belief and worship, public and private, such as has hitherto been enjoyed by them up to the present moment, shall be guaranteed to them for the future.

No duties or charges shall be imposed upon vessels arriving in or departing from the free port of Greytown, other than such as may be sufficient for the due maintenance and safety of the navigation, for providing lights and beacons, and for defraying the expense of the police of the port; neither shall any duties or charges be levied in the free port on goods arriving therein, in transit from sea to sea. But nothing contained in this article shall be construed to prevent the Republic of Nicaragua from levying the usual duties on goods destined for consumption within the territory of the republic.

VIII. All *bona fide* grants of land for due consideration, made in the

name and by the authority of the Mosquito Indians since the 1st of January, 1848, and lying beyond the limits of the territory reserved for the said Indians, shall be confirmed, provided the same shall not exceed in any case the extent of 100 yards square, if within the limits of San Juan or Greytown, or one league square if without the same, and provided that such grant shall not interfere with other legal grants made previously to that date by Spain, the Republic of Central America, or Nicaragua; and provided further, that no such grant shall include territory desired by the government of the latter state for forts, arsenals, or other public buildings. This stipulation only embraces those grants of land made since the 1st of January, 1848.

In case, however, any of the grants referred to in the preceding paragraph of this article should be found to exceed the stipulated extent, the commissioners hereinafter mentioned shall, if satisfied of the *bona fides* of any such grants, confirm to the grantee or grantees, or to his or their representatives or assigns, an area only equal to the stipulated extent.

And in case any *bona fide* grant, or any part thereof, should be desired by the government for forts, arsenals, or other public buildings, an equivalent extent of land shall be allotted to the grantees elsewhere.

* It is understood that the grants of land treated of in this article shall not extend to the westward of the territory reserved for the Mosquito Indians in Article II further than 84° 30′ of longitude, in a line parallel and equal with that of said territory on the same side; and if it should appear that any grants have been made further in the interior of the republic, the lands acquired *bona fide* shall be replaced with those that are within the limits defined under the regulations agreed upon.

IX. Her Britannic Majesty and the Republic of Nicaragua shall, within 6 months after the exchange of the ratifications of the present treaty, appoint each a commissioner for the purpose of deciding upon the *bona fides* of all grants of land mentioned in the preceding article as having been made by the Mosquito Indians of lands heretofore possessed by them, and lying beyond the limits of the territory described in Article I.

X. The commissioners mentioned in the preceding article shall, at the earliest convenient period after they shall have been respectively named, meet at such place or places as shall be hereafter fixed; and shall, before proceeding to any business, make and subscribe a solemn declaration that they will impartially and carefully examine and decide, to the best of their judgment, and according to justice and equity, without fear, favor, or affection to their own country, all the matters referred to them for their decision; and such declaration shall be entered on the record of their proceedings.

The commissioners shall then, and before proceeding to any other business, name some third person to act as arbitrator or umpire in any case or cases in which they may themselves differ in opinion. If they should not be able to agree upon the selection of such a person, the commissioner on either side shall name a person, and in each and every case in which the commissioners may differ in opinion as to the decision which they ought to give, it shall be determined by lot which of the two persons so named shall be arbitrator or umpire in that particular case. The person or persons so to be chosen shall, before proceeding to act, make and subscribe a solemn declaration, in a form similar to that which shall already have been made and subscribed by the commissioners, which declaration shall also be entered on the record of the proceedings.

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* See declaration, August 2d, 1860, page 154.

In the event of the death, absence, or incapacity of such person or persons, or of his or their omiting, or declining, or ceasing to act as such arbitrator or umpire, another person or other persons shall be named as aforesaid to act in his or their place or stead, and shall make and subscribe such declaration as aforesaid.

Her Britannic Majesty and the Republic of Nicaragua shall engage to consider the decision of the two commissioners conjointly, or of the arbitrator or umpire, as the case may be, as final and conclusive on the matters to be referred to their decision, and forthwith to give full effect to the same.

XI. The commissioners and the arbitrators or umpires shall keep accurate records and correct minutes or notes of all their proceedings, with the dates thereof, and shall appoint and employ such clerk or clerks, or other persons, as they shall find necessary to assist them in the transaction of the business which may come before them.

The salaries of the commissioners and of the clerk or clerks shall be paid by their respective governments.

The salary of the arbitrators or umpires and their contingent expenses shall be defrayed in equal moieties by the two governments.

XII. The present Treaty shall be ratified by Her Britannic Majesty, and by the Congress of the Republic of Nicaragua, and the ratifications shall be exchanged at London as soon as possible within the space of six months.

In witness whereof the respective plenipotentiaries have signed the same, and have affixed thereto their respective seals.

Done at Managua, this 28th day of January, in the year of our Lord 1860.

[L. S.] CHARLES LENNOX WYKE.

[L. S.] PEDRO ZELEDON.

DECLARATION.

In proceeding to the exchange of the ratifications of the Treaty concluded and signed at Managua on the 28 of January, 1860, between Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, and the Republic of Nicaragua, relative to the Mosquito Indians and to the rights and claims of British subjects, the undersigned, Her Britannic Majesty's principal Secretary of State for Foreign Affairs, and the Envoy Extraordinary and Minister Plenipotentiary of the Republic of Nicaragua, hereby declare that the limitation laid down in the paragraph added by the Congress of the Republic to Article VIII * of the said Treaty applies to grants of land to the west of the meridian of 84° 30′ of longitude throughout the whole extent of the territory hitherto occupied or claimed by the Mosquito Indians within the frontier of the Republic, but not to grants in any part of the said territory to the east of that meridian line.

In witness whereof the undersigned have signed the present declaration, and have affixed thereto their respective seals.

Done at London, the 2d day of August, in the year of our Lord 1860.

[L. S.] J. RUSSELL.

[L. S.] J. DE MARCOLETA.

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* Page 153.

62.—*President Buchanan's message to Congress, December* 3, 1860.

[Extract.]

The discordant constructions of the Clayton and Bulwer treaty between the two governments, which, at different periods of the discussion, bore a threatening aspect, have resulted in a final settlement entirely satisfactory to this government.

In my last annual message I informed Congress that the British Government had not then

> Completed treaty arrangements with the Republics of Honduras and Nicaragua in pursuance of the understanding between the two governments. It is, nevertheless, confidently expected that this good work will ere long be accomplished.

This confident expectation has since been fulfilled. Her Britannic Majesty concluded a treaty with Honduras on the 28th November, 1859, and with Nicaragua on the 28th August, 1860, relinquishing the Mosquito protectorate. Besides, by the former the Bay Islands are recognized as a part of the Republic of Honduras. It may be observed that the stipulations of these treaties conform in every important particular to the amendments adopted by the Senate of the United States to the treaty concluded at London on the 17th October, 1856, between the two governments. It will be recollected that this treaty was rejected by the British Government because of its objection to the just and important amendment of the Senate to the article relating to Ruatan and the other islands in the Bay of Honduras.

63.—*Mr. Seward to Mr. Adams.*

No. 1745.] DEPARTMENT OF STATE,
Washington, April 25, 1866.

SIR: Towards the close of Mr. Polk's administration the British Government, disturbed, perhaps, by the recent acquisition of territory by the United States on the Pacific, showed what we thought to be a disposition to contend with the governments of the Central American states, with the ultimate object, as was supposed, of acquiring dominion there, and also a control of any ship-canal which might be made between the two oceans by the way of the San Juan River and Lake Nicaragua. British subjects had long before that time lent those governments money, the interest on which was in arrears, chiefly in consequence of the strife between the states which ensued upon their separation and as a confederacy.

War measures were determined upon to recover this interest; among others, the seizure of the island of Tiger, belonging to Honduras, in the Bay of Fonseca, was made by a British naval force in October, 1849. This seizure was protested against by Mr. Squier, the United States chargé d'affaires in Nicaragua, and a disavowal of the proceedings by the British Government was required by Mr. Clayton in an instruction to Mr. Abbott Lawrence, at London, of the 29th of December, 1849.

Insomuch as one route (by some supposed the best route) for the ship-canal from the lake to the Pacific lay along the Estero Real, which empties into the Bay of Fonseca, near Tiger Island, Mr. Squier deemed himself warranted in incorporating in a general commercial treaty with

Honduras, which he signed on the 28th of September, 1849, provisions for acquiring land for naval stations on that island or on the continent in its vicinity. By what is called a protocol, of the same date, Honduras ceded Tiger Island to the United States, pending the ratification or rejection of the general treaty, provided that the time should exceed eighteen months.

These stipulations were entered into by Mr. Squier without instructions from the Department, and when the treaty and additional articles were received, he was reproved for them. They were never laid before the Senate. It is not to be doubted, however, that they occasioned uneasiness to the British Government, and in a great degree led to the Clayton-Bulwer treaty of the 19th of April, 1850.

The preamble of that treaty states that its object was to fix the views and intentions of the parties in regard to the ship canal.

The first article of the treaty, still referring to the ship-canal, stipulates that neither party will erect fortifications commanding the same, or in the vicinity thereof, or occupy, or fortify, or colonize, or assume or exercise dominion in any part of Central America.

It seems obvious that the renunciation by the parties to this instrument of a right to acquire dominion in Central America was intended to prevent either of them from obtaining control over the proposed ship-canal. At the time the treaty was concluded there was every prospect that that work would not only soon be begun, but that it would be carried to a successful conclusion. For reasons, however, which it is not necessary to specify, it never was even commenced, and at present there does not appear to be a likelihood of its being undertaken. It may be a question, therefore, supposing that the canal should never be begun, whether the renunciatory clauses of the treaty are to have perpetual operation.

Technically speaking, this question might be decided in the negative. Still, so long as it should remain a question, it would not comport with good faith for either party to do anything which might be deemed contrary to even the spirit of the treaty.

It is becoming more and more certain every day that not only naval warfare in the future, but also all navigation of war vessels in time of peace must be by steam. This necessity will occasion little or no inconvenience to the principal maritime powers of Europe, and especially to Great Britain, as those powers have possessions in various parts of the globe where they can have stores of coal and provisions for the use of their vessels. We are differently situated. We have no possession beyond the limits of the United States. Foreign colonization has never been favored by statesmen in this country either on general grounds or as in harmony with our peculiar condition. There is no change or likely to be any in this respect. It is indispensable for us, however, to have coaling stations under our own flag for naval observation and police, and for defensive war as well as for the protection of our widely spread commerce when we are at peace ourselves. This want, even for our commercial marine, is nowhere more sensibly felt than on the track between Panama and San Francisco. The question then occurs what points beyond our jurisdiction would be most eligible for this purpose?

Whatever opinion might be entertained in regard to any other sites, there would be no question that Tiger Island would be exceedingly desirable for that purpose.

Under these circumstances, you will sound Lord Clarendon as to the disposition of his government to favor us in acquiring coaling stations in Central America, notwithstanding the stipulation contained in the

Clayton-Bulwer treaty. In doing this, however, you will use general terms only, and will by no means allow it to be supposed that we particularly covet Tiger Island. You will execute this instruction at such time and in such way as to you may seem best, and inform the Department of the result, so that the United States minister to Honduras may be directed to proceed accordingly.

It is supposed that you may probably be able to introduce the subject to the Earl of Clarendon's attention by suggesting that a negotiation with a view to the special end mentioned might be made an element in a general negotiation for settlement of the northwest-boundary question and of the conflicting claims of the two countries which have arisen during the late rebellion in the United States.

I am, &c.,

WILLIAM H. SEWARD.

64.—*Extract from the report of Mr. Fish, Secretary of State, accompanying President Grant's message to the Senate of July* 14, 1870.

DEPARTMENT OF STATE,
Washington, July 14, 1870.

* * * * * * *

The avoidance of entangling alliances, the characteristic feature of the foreign policy of Washington, sprang from this condition of things. But the entangling alliances which then existed were engagements made with France as a part of the general contract under which aid was furnished to us for the achievement of our independence. France was willing to waive the letter of the obligation as to her West India possessions, but demanded, in its stead, privileges in our ports which the administration was unwilling to concede. To make its refusal acceptable to a public which sympathized with France, the cabinet of General Washington exaggerated the principle into a theory tending to national isolation.

The public measures designed to maintain unimpaired the domestic sovereignty and the international neutrality of the United States were independent of this policy, though apparently incidental to it. The municipal laws enacted by Congress then and since have been but declarations of the law of nations. They are essential to the preservation of our national dignity and honor; they have for their object to repress and punish all enterprises of private war, one of the last relics of mediæval barbarism; and they have descended to us from the fathers of the republic, supported and enforced by every succeeding President of the United States.

The foreign policy of these early days was not a narrow one. During this period we secured the evacuation by Great Britain of the country wrongfully occupied by her on the lake; we acquired Louisiana; we measured forces on the sea with France, and on the land and sea with England; we set the example of resisting and chastising the piracies of the Barbary States; we initiated in negotiations with Prussia the long line of treaties for the liberalization of war and the promotion of international intercourse; and we steadily demanded, and at length obtained, indemnification from various governments for the losses we had suffered by foreign spoliations in the wars of Europe.

To this point in our foreign policy we had arrived when the revolu-

tionary movements in Spanish and Portuguese America compelled a modification of our relations with Europe, in consequence of the rise of new and independent states in America.

The revolution, which commenced in 1810 and extended through all the Spanish-American continental colonies, after vain efforts of repression on the part of Spain, protracted through twenty years, terminated in the establishment of the independent states of Mexico, Guatemala, San Salvador, Honduras, Nicaragua, Costa Rica, Venezuela, Colombia, Ecuador, Peru, Chili, Bolivia, the Argentine Republic, Uruguay, and Paraguay, to which the Empire of Brazil came in time to be added. These events necessarily enlarged the sphere of action of the United States, and essentially modified our relations with Europe, and our attitude to the rest of this continent.

The new states were, like ourselves, revolted colonies. They continued the precedent we had set, of separating from Europe. Their assumption of independence was stimulated by our example. They professedly imitated us, and copied our national Constitution, sometimes even to their inconvenience.

The Spanish-American colonies had not the same preparation for independence that we had. Each of the British colonies possessed complete local autonomy. Its formal transition from dependence to independence consisted chiefly in expelling the British governor of the colony, and electing a governor of the State, from which to the organized Union was but a step. All these conditions of success were wanting in Spanish America, and hence many of the difficulties in their career as independent states; and further, while the revolution in British America was the exclusive result of the march of opinion in the British colonies, the simultaneous action of the separate Spanish colonies, though showing a desire for independence, was principally produced by the accident of the invasion of Spain by France.

The formation of these new sovereignties in America was important to us, not only because of the cessation of colonial monopolies to that extent, but because of the geographical relations to us, held by so many new nations, all, like ourselves, created from European stock, and interested in excluding European politics, dynastic questions, and balances of power from further influence in the New World.

Thus the United States were forced into new lines of action, which, though apparently in some respects conflicting, were really in harmony with the line marked out by Washington. The avoidance of entangling political alliances, and the maintenance of our own independent neutrality became doubly important from the fact that they became applicable to the new republics as well as to the mother country. The duty of non-interference had been admitted by every President. The question came up in the time of the first Adams, on the occasion of the enlistment projects of Miranda. It appeared again under Jefferson (anterior to the revolt of the Spanish colonies) in the schemes of Aaron Burr. It was an ever-present question in the administrations of Madison, Monroe, and the younger Adams, in reference to the questions of foreign enlistment or equipment in the United States, and when these new republics entered the family of nations, many of them very feeble, and all too much subject to internal revolution and civil war, a strict adherence to our previous policy and a strict enforcement of our laws became essential to the preservation of friendly relations with them; for, since that time, it has been one of the principal cares of those intrusted with the administration of the government, to prevent piratical expeditions against these sister republics from leaving our ports. And thus the

changed condition of the New World made no change in the traditional and peaceful policy of the United States in this respect.

In one respect, however, the advent of these new states in America did compel an apparent change of foreign policy on our part. It devolved upon us the determination of the great international question, at what time, and under what circumstances, to recognize a new power as entitled to a place among the family of nations. There was but little of precedent to guide us, except our own case. Something, indeed, could be inferred from the historical origin of the Netherlands and Switzerland. But our own case, carefully and conscientiously considered, was sufficient to guide us to right conclusions. We maintained our position of international friendship and of treaty obligations toward Spain, but we did not consider that we were bound to wait for its recognition of the new republics before admitting them into treaty relations with us as sovereign States. We held that it was for us to judge whether or not they had attained to the condition of actual independence, and the consequent right of recognition by us. We considered this question of fact deliberately and coolly. We sent commissioners to Spanish America to ascertain and report for our information concerning their actual circumstances, and in the fullness of time we acknowledged their independence; we exchanged diplomatic ministers, and made treaties of amity with them, the earliest of which, negotiated by Mr. John Quincy Adams, served as the model for the subsequent treaties with the Spanish-American republics. We also, simultaneously therewith, exerted our good offices with Spain, to induce her to submit to the inevitable result, and herself to accept and acknowledge the independence of her late colonies. We endeavored to induce Russia to join us in these representations. In all this our action was positive, in the direction of promoting the complete political separation of America from Europe.

A vast field was thus opened to the statesmen of the United States for the peaceful introduction, the spread, and the permanent establishment of the American ideas of republican government, of modification of the laws of war, of liberalization of commerce, of religious freedom and toleration, and of the emancipation of the New World from the dynastic and balance of power controversies of Europe.

Mr. John Quincy Adams, beyond any other statesman of the time in this country, had the knowledge and experience, both European and American, the comprehension of thought and purpose, and the moral convictions which peculiarly fitted him to introduce our country into this new field, and to lay the foundation of an American policy. The declaration known as the Monroe doctrine, and the objects and purposes of the congress of Panama, both supposed to have been largely inspired by Mr. Adams, have influenced public events from that day to this, as a principle of government for this continent and its adjacent islands.

It was at the period of the congress of Aix-la-Chapelle and of Laybach, when the "holy alliance" was combined to arrest all political changes in Europe in the sense of liberty, when they were intervening in Southern Europe for the re-establishment of absolutism, and when they were meditating interference to check the progress of free government in America, that Mr. Monroe, in his annual message of December, 1823, declared that the United States would consider any attempt to extend the European system to any portion of this hemisphere as dangerous to our peace and safety. "With the existing colonies or dependencies of any European power," he said, "we have not interfered and

shall not interfere. But with the governments who have declared their independence, and maintained it, and whose independence we have on great consideration and on just principles acknowledged, we could not view any interposition for the purpose of oppressing them, or controlling, in any other manner, their destiny, by any European power, in any other light than as the manifestation of an unfriendly feeling towards the United States."

This declaration resolved the solution of the immediate question of the independence of the Spanish-American colonies, and is supposed to have exercised some influence upon the course of the British cabinet in regard to the absolutist schemes in Europe as well as in America.

It has also exercised a permanent influence on this continent. It was at once invoked in consequence of the supposed peril of Cuba on the side of Europe; it was applied to a similar danger threatening Yucatan; it was embodied in the treaty of the United States and Great Britain as to Central America; it produced the successful opposition of the United States to the attempt of Great Britain to exercise dominion in Nicaragua under the cover of the Mosquito Indians; and it operated in like manner to prevent the establishment of a European dynasty in Mexico.

The United States stand solemnly committed by repeated declarations and repeated acts to this doctrine, and its application to the affairs of this continent. In his message to the two houses of Congress at the commencement of the present session, the President, following the teachings of all our history, said that the existing "dependencies are no longer regarded as subject to transfer from one European power to another. When the present relation of colonies ceases, they are to become independent powers, exercising the right of choice and of self-control in the determination of their future condition and relations with other powers."

This policy is not a policy of aggression; but it opposes the creation of European dominion on American soil, or its transfer to other European powers, and it looks hopefully to the time when, by the voluntary departure of European governments from this continent and the adjacent islands, America shall be wholly American.

It does not contemplate forcible intervention in any legitimate contest; but it protests against permitting such a contest to result in the increase of European power or influence; and it ever impels this government, as in the late contest between the South American republics and Spain, to interpose its good offices to secure an honorable peace.

The congress of Panama was planned by Bolivar to secure the union of Spanish America against Spain. It had originally military as well as political purposes. In the military objects the United States could take no part; and indeed the necessity for such objects ceased when the full effects of Mr. Monroe's declarations were felt. But the pacific objects of the Congress, the establishment of close and cordial relations of amity, the creation of commercial intercourse, of interchange of political thought, and of habits of good understanding between the new republics and the United States and their respective citizens, might perhaps have been attained, had the administration of that day received the united support of the country. Unhappily they were lost; the new states were removed from the sympathetic and protecting influence of our example, and their commerce, which we might then have secured, passed into other hands, unfriendly to the United States.

In looking back upon the Panama congress from this length of time, it is easy to understand why the earnest and patriotic men who endeavored to crystallize an American system for this continent failed.

Mr. Clay and Mr. Adams were far-sighted statesmen, but unfortunately they struck against the rock of African slavery. One of the questions proposed for discussion in the conference was "The consideration of the means to be adopted for the entire abolition of the African slave trade," to which proposition the committee of the United States Senate of that day replied, "The United States have not certainly the right, and ought never to feel the inclination, to dictate to others who may differ with them upon this subject, nor do the committee see the expediency of insulting other states, with whom we are maintaining relations of perfect amity, by ascending the moral chair, and proclaiming from thence mere abstract principles, of the rectitude of which each nation enjoys the perfect right of deciding for itself." The same committee also alluded to the possibility that the condition of the islands of Cuba and Porto Rico, still the possessions of Spain, and still slaveholding, might be made the subject of discussion and of contemplated action by the Panama congress. "If ever the United States [they said] permit themselves to be associated with these nations in any general congress assembled for the discussion of common plans in any way affecting European interests, they will, by such act, not only deprive themselves of the ability they now possess of rendering useful assistance to the other American states, but also produce other effects prejudicial to their own interests."

Thus the necessity at that day of preserving the great interest of the Southern States in African slavery, and of preventing a change in the character of labor in the islands of Cuba and Porto Rico, lost to the United States the opportunity of giving a permanent direction to the political and commercial connections of the newly enfranchised Spanish-American states, and their trade passed into hands unfriendly to the United States, and has remained there ever since.

Events, subsequent to that date, have tended to place us in a position to retrieve our mistakes; among which events may be particularly named the suppression of the rebellion, the manifestation of our undeveloped and unexpected military power, the retirement of the French from Mexico, and the abolition of slavery in the United States.

There is good reason to believe that the latter fact has had an important influence in our favor in Spanish America. It has caused us to be regarded there with more sympathetic as well as more respectful consideration. It has relieved those republics from the fear of filibusterism which had been formerly incited against Central America and Mexico in the interest of slave extension; and it has produced an impression of the stability of our institutions and of our public strength sufficient to dissipate the fears of our friends or the hopes of those who wish us ill.

Thus there exists in the Spanish-American republics confidence toward the United States. On our side they find a feeling of cordial amity and friendship, and a desire to cultivate and develop our common interests on this continent. With some of these states our relations are more intimate than with others, either by reason of closer similarity of constitutional forms, of greater commercial intercourse, of proximity in fact, or of the construction or contemplated construction of lines of transit for our trade and commerce between the Atlantic and the Pacific. With several of them we have peculiar treaty relations. The treaty of 1846 between the United States and New Grenada contains stipulations of guaranty for the neutrality of that part of the Isthmus within the present territory of Colombia, and for the protection of the rights of sovereignty and property therein belonging to Colombia. Similar stip-

ulations appear in the treaty of 1867 with Nicaragua, and of July, 1864, with Honduras. Those treaties (like the treaty of alliance made with France in 1778 by Dr. Franklin, Silas Deane, and Arthur Lee) constitute *pro tanto* a true protective alliance between the United States and each of those republics. Provisions of like effect appear in the treaty of April 19, 1850, between Great Britain and the United States.

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65.—*Mr. Fish to General Schenck.*

No. 375.] DEPARTMENT OF STATE,
Washington, April 26, 1873.

SIR: You are aware that a main object of the Clayton-Bulwer treaty, so called, of the 19th of April, 1850, was to provide against obstruction by either party to a ship-canal to the Pacific through Nicaragua. A work of that kind was then deemed specially necessary and desirable for us, as California had recently been acquired, the only practicable way to which was across the Isthmus of Panama, or around Cape Horn. For some time previously to date of that instrument, and especially during the considerable period when the United States were without a diplomatic representative in Central America, it seemed to be the policy of the British Government to avail itself of what was called its protectorate of the King of Mosquitos to wrest from Nicaragua that part of its territory claimed on behalf of that Indian chief, including, of course, the mouths of the San Juan River, by the way of which it was supposed the proposed ship-canal must pass. The Clayton-Bulwer treaty effectually checked this pretension. It also, in terms, forbade either party to occupy or fortify in any part of Central America. The British Government, probably actuated by an apprehension that this stipulation might be construed against their claims at Belize, Honduras, instructed Sir H. L. Bulwer to make the declaration of 29th of June, 1850, when the ratifications were to be exchanged, to the effect that they did not understand the engagements of the convention to apply to Belize and its dependencies. In a note to Sir Henry of the 4th of July, 1850, Mr. Clayton acknowledged that it was not the purpose of the convention to apply to Belize and its dependencies.

A similar acknowledgment is contained in a memorandum of the 5th of July, 1850, signed by Mr. Clayton, which says that he at the same time declined to affirm or deny the British title in their settlement or its alleged dependencies. Among the latter what are called the Bay Islands were claimed to belong. The British Government, however, having converted them into a separate colony, this and the continuance of its protectorate, so called, over the Mosquito Indians, were regarded as virtually such breaches of the Clayton-Bulwer treaty as to call for the remonstrances which Mr. Buchanan, and subsequently Mr. Dallas, were instructed to address, and which they did address, to that government. The answer of that government was in substance that the Clayton-Bulwer treaty was merely designed to provide for the future, and was not intended to affect any rights or claims which Great Britain may have had in Central America at the time of its conclusion. This pretension was effectually answered by Mr. Buchanan in his reply to Lord Clarendon's memorandum on the subject, which you will find on the file or record of your legation. Ultimately, on the 17th of October, 1856, a treaty which is called the Dallas-Clarendon treaty was signed at London. The ob-

ject of this instrument was to compose the differences between the two governments, especially in regard to the Bay Islands and the Mosquito protectorate. When the treaty reached here it must have been obvious to the Executive, that if it accomplished either of those purposes, it was in an incomplete and unacceptable way. Still the treaty was laid before the Senate, which body, though it did not absolutely reject it, appended to it so many and such important amendments that they were not accepted by the British Government, and the whole business proved abortive.

The British Government then sought negotiations with Nicaragua, Guatemala, and Honduras, separately, to attain the principal objects which it hoped to compass by means of the Dallas-Clarendon treaty, if it had gone into effect as it was signed.

The purposes of that government were in the main accomplished. On the 28th of January, 1860, a treaty between Great Britain and Nicaragua was signed at Managua. Though this instrument restored to that republic the nominal sovereignty over that part of its territory which had previously been claimed as belonging to the kingdom of the Mosquitos, it assigned boundaries to the Mosquito Reservation probably beyond the limits which any member of that tribe had ever seen, even when in chase of wild animals. Worst of all, however, it confirmed the grants of land previously made in Mosquito territory. The similar stipulation on this subject in the Dallas-Clarendon treaty was perhaps the most objectionable of any, as it violated the cardinal rule of all European colonists in America, including Great Britain herself, that the aborigines had no title to the soil which they could confer upon individuals.

This rule has repeatedly been confirmed by judicial decisions, and especially by the Supreme Court of the United States. It is supposed to be superfluous to add that it is understood the grantees of the Mosquito chief, respecting whose interests the British Government was so solicitous, were the subjects of the latter.

It is supposed that the expedition of Walker to Nicaragua made such an unfavorable impression on public opinion there, in respect to this country, as to prepare the way for the treaty with Great Britain. A rumor was current in that quarter, and was by many believed to be true, that Walker was an agent of this government, which, it was supposed, had covertly sent him thither to obtain control of the country. This, however, was so far from the truth that everything within its power was done by this government towards preventing the departure of Walker.

Besides the treaty with Nicaragua, just adverted to, there was a treaty between Great Britain and Honduras, signed on the 28th November, 1859, the main object of which was the restitution to the latter of the Bay Islands, which had for some time before been converted into a British colony.

This treaty also contained stipulations in regard to Mosquito Indians in Honduras territory similar to that in the treaty with Nicaragua.

On the 30th of April, 1859, a treaty between Great Britain and Guatemala was also signed, by which the boundaries of the British settlement at Belize, so called, were extended to the Sarstoon River. This instrument contained provisions for the appointment of commissioners to mark the boundaries, and for the construction of a road from Guatemala to the fittest place on the Atlantic coast near Belize. By a supplementary convention between the parties, of the 5th of August, 1863, Great Britain agreed, upon certain conditions, to contribute fifty thousand pounds sterling towards the construction of the road referred to.

From the note of the 4th of December last, addressed to this department by M. Dardon, the minister of Guatemala here, it appears that when the joint commission for running the boundary line reached the Sarstoon River the British commissioner, finding that his countrymen were trespassing beyond that limit, refused to proceed, and the stipulation on the subject, if not virtually canceled, has, at least, been suspended.

The supplementary convention not having been ratified by Guatemala in season, it is stated that the British Government has notified that of Guatemala that it would regard the stipulation on the subject of the road contained in the treaty of 1859 as at an end.

Other important information on these subjects is contained in the letter and its accompaniments of Mr. Henry Savage, to this department of the 16th of October last. He is a native of this country and at one time was consul at Guatemala.

He has frequently, in the absence of a diplomatic agent of the United States in that quarter, furnished this department with valuable information in regard to Central American affairs.

Mr. Dardon says that his government also regards its treaty of 1859 with Great Britain at an end, and requests on its behalf the co-operation and support of this government towards preventing further encroachments by British subjects on the territory of Guatemala. It is believed that if such encroachments are authorized or countenanced by that government it will be tantamount to a breach of its engagement not to occupy any part of Central America. Before, however, officially mentioning the subject to Earl Granville, it would be advisable to ascertain the correctness of the representation of Mr. Dardon, as to the cause of the discontinuance of the demarkation of the boundary.

If the statement of that gentleman should prove to be correct, you will then formally remonstrate against any trespass by British subjects, with the connivance of their government, upon the territory of Guatemala, as an infringement of the Clayton-Bulwer treaty which will be very unacceptable in this country.

I am, &c.,

HAMILTON FISH.

66.—*Message of President Hayes to Congress, March* 8, 1880.

[Extract.]

The policy of this country is a canal under American control. The United States cannot consent to the surrender of this control to any European power, or to any combination of European powers. If existing treaties between the United States and other nations, or if the rights of sovereignty or property of other nations stand in the way of this policy—a contingency which is not apprehended—suitable steps should be taken by just and liberal nogotiations to promote and establish the American policy on this subject, consistently with the rights of the nations to be affected by it.

The capital invested by corporations or citizens of other countries in such an enterprise must, in a great degree, look for protection to one or more of the great powers of the world. No European power can intervene for such protection, without adopting measures on this continent which the United States would deem wholly inadmissible. If the protection of the United States is relied upon, the United States must ex-

ercise such control as will enable this country to protect its national interests and maintain the rights of those whose private capital is embarked in the work.

An interoceanic canal across the American Isthmus will essentially change the geographical relations between the Atlantic and Pacific coasts of the United States, and between the United States and the rest of the world. It will be the great ocean thoroughfare between our Atlantic and our Pacific shores, and virtually a part of the coast line of the United States. Our merely commercial interest in it is greater than that of all other countries, while its relations to our power and prosperity as a nation, to our means of defense, our unity, peace, and safety, are matters of paramount concern to the people of the United States. No other great power would, under similar circumstances, fail to assert a rightful control over a work so closely and vitally affecting its interest and welfare.

Without urging further the grounds of my opinion, I repeat, in conclusion, that it is the right and the duty of the United States to assert and maintain such supervision and authority over any interoceanic canal across the isthmus that connects North and South America as will protect our national interests. This I am quite sure will be found not only compatible with, but promotive of, the widest and most permanent advantage to commerce and civilization.

67.—*Extract from the report of Mr. Evarts, Secretary of State, accompanying President Hayes's message (No. 66) and the Wyse concession for the Panama Canal, which it inclosed.*

The recent contract or concession made by the Government of Colombia with an association of foreign projectors, the text of which is herewith annexed (inclosure No. 5), brings to attention some considerations of more or less practical importance, according as we may estimate the feasibility of the project and the financial prospects of the projectors. It does, however, present an occasion for a deliberate indication by the Government of the United States of its relations to enterprises of this nature, both in its position as an American power, and under its specific treaty rights and obligations towards the United States of Colombia.

In the mere aspect of a contribution of capital, in the motive of profit to the investors, on the one part, and of a proprietary administration by Colombia of the transit through its territory as a source of legitimate revenue and local prosperity, the proposed canal might seem to fall within the ordinary conditions of pecuniary enterprise and internal development, which the general interests of commerce favor, and which it has been the policy of this government to stimulate and assist.

But this view of the subject is quite too narrow and too superficial. It overlooks the direct relations of the other American nations to the contemplated change in the route of water-borne commerce, and the indirect but equally weighty considerations by which the relations of the American nations to the great powers of Europe will be modified by this change. It does not penetrate the formal character of the contract as between private capital and local administration, and appreciate its real and far-reaching operation upon the commercial and political interests of the American continent.

The United States, therefore, as the great commercial and political power of America, becomes, necessarily, a principal party to any project

which shall exhibit such solidity and proportions as to distinguish it from the unsubstantial and illusory schemes which have, from time to time, proposed to solve the problem of interoceanic transit. The question involved presents itself distinctly to this government as a territorial one, in the administration of which, as such, it must exercise a potential control.

While this attitude of the United States to the political and commercial problem of an interoceanic canal, at whatever point, would seem to attach to their position on the continent, the particular rights and obligations in reference to any transit across the Isthmus of Panama, which grow out of the mutual engagements of the treaty with Colombia, fix more definitely the interest of this government in any material changes of that isthmus as the theater of these rights and obligations.

It is manifest that so stupendous a change from the natural configuration of this hemisphere as transforms the Isthmus of Panama from being a barrier between the Atlantic and Pacific Oceans into a gateway and thoroughfare between them for the navies and merchant ships of the world bears directly upon the weight and burden of our guarantees under that treaty. It is equally manifest, and only less important, that the organization and nationality of an immense capital and the administration of a great and growing force of managers and laborers, and the throng of population likely to attend the prosperity of the enterprise, affect essentially the conditions under which the United States may be called upon to perform the engagements of that treaty. The guarantee of the neutrality of the transit and of the sovereignty and property of Colombia in the isthmus are one thing while the isthmus remains in its natural and unpeopled state, and quite another when it shall have been opened to the interests, the cupidities, and the ambitions of the great commercial nations, and occupied by populations of foreign allegiance and discordant habits.

So obvious are these propositions that it may well be assumed that no contract or negotiations could ever be entered into between private projectors and the Government of Colombia except in contemplation of this position of the United States under the treaty, and of the necessity that both the private interests and the public engagements involved, in reliance upon the power and faith of this government for their protection, must be conformed to its rightful participation and control in any arrangements that may seriously affect the discharge of its stipulated responsibilities.

[Inclosure in No. 67.—Translation from the Diario Oficial of Bogota, Wednesday, May 22, 1878.]

Law 28th of 1878 (*18th of May*) "*approving the contract for the construction of an interoceanic canal across Colombian territory.*"

The Congress of the United States of Colombia, after an examination of the contract, which is verbatim as follows:

CONTRACT FOR THE CONSTRUCTION OF AN INTEROCEANIC CANAL ACROSS COLOMBIAN TERRITORY.

Eustorgio Salgar, secretary of the interior and of foreign r lations of the United States of Colombia, duly authorized, of the one part, and of the other part Lucien N. B. Wyse, chief of the Isthmus Scientific Surveying Expedition in 1876, 1877, and 1878, member and delegate of the board of directors of the International Interoceanic Canal Association, presided by General Etienne Türr, in conformity with powers bestowed at Paris, from the 27th to the 29th of October, 1877, have celebrated the following contract:

ARTICLE 1.* The Government of the United States of Colombia grants to Mr. Lucien

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*This article modified by Colombian Congress. See decree which follows.

N. B. Wyse, who accepts it in the name of the civil International Interoceanic Canal Association, represented by their board of directors, the exclusive privilege for the construction across its territory, and for the operating of a canal between the Atlantic and Pacific Oceans. Said canal may be constructed without restrictive stipulations of any kind.

This concession is made under the following conditions:

1st. The duration of the privilege shall be for ninety-nine years from the day on which the canal shall be wholly or partially opened to public service, or when the grantees or their representatives commence to collect the dues on transit and navigation.

2d. From the date of approbation by the Colombian Congress for the opening of the interoceanic canal, the government of the republic cannot construct, nor concede to any company or individual, under any consideration whatever, the right to construct another canal across Colombian territory which shall communicate the two oceans. Should the grantees wish to construct a railroad as an auxiliary to the canal, the government (with the exception of existing rights) cannot grant to any other company or individual, the right to build another interoceanic railroad, nor do so, itself, during the time allowed for the construction and use of the canal.

3d. The necessary studies of the ground, and the route for the line of the canal, shall be made, at the expense of the grantees, by an international commission of individuals and competent engineers, in which two Colombian engineers shall take part. The commission shall determine the general route of the canal and report to the Colombian Government directly, or to its diplomatic agents in the United States or Europe, upon the results obtained, at the latest in 1881, unless unavoidable circumstances, clearly proven, should prevent their so doing. The report shall comprise in duplicate the scientific labors performed, and an estimate of the projected work.

4th. The grantees shall then have a period of two years to organize a universal joint stock company, which shall take charge of the enterprise, and of the construction of the canal. This term shall commence from the date mentioned in the preceding paragraph.

5th. The canal shall be finished and placed at the public service within the subsequent twelve years after the formation of the company which will undertake its construction, but the executive power is authorized to grant a further maximum term of six years in the case of encountering superhuman obstacles beyond the power of the company, and if, after one-third of the canal is buil , the company should acknowledge the impossibility of concluding the work in the said twelve years.

6th. The canal shall have the length, depth, and all other conditions requisite in order that sailing vessels and steamships measuring up to 140 meters long, 16 meters in width, and 8 meters in draught shall, with lowered topmasts, be able to pass the canal.

7th. All public lands which may be required for the route of the canal, the ports, stations, wharves, moorings, warehouses, and in general for the construction and service of the canal as well as for the railway, should it be convenient to build it, shall be ceded gratis to the grantees.

8th. These unoccupied public lands shall revert to the government of the republic, with the railroad and canal, at the termination of this privilege; there is also granted for the use of the canal a belt of land two hundred meters wide on each side of its banks throughout all the distance which it may run, but the owners of lands on its banks shall have free access to the canal and its ports as well as to the right of use of any roads which the grantees may open there; and this without paying any dues to the company.

9th. If the lands through which the canal shall pass, or upon which the railroad may be built, should, in whole or in part, be private property, the grantee shall have the right to demand their expropriation by the government according to all the legal formalities in such cases. The indemnity which shall be made to the land owners, and which shall be based on their actual value, shall be at the expense of the company. The grantees shall enjoy in this case, and in those of temporary occupation of private property, all the rights and privileges which the existing legislation confers.

10th. The grantees may establish and operate at their cost the telegraphic lines which they may consider useful as auxiliaries in the building and management of the canal.

ART. 2,* Within the term of twelve months after the international commission shall have presented the result of their definitive surveys, the grantees will deposit in the bank or banks of London, which the national executive power may designate, the sum of seven hundred and fifty thousand francs as security for the accomplishment of the work. The receipt of said bank or banks shall be a voucher of the fulfillment of said engagement. The deposit shall be made in certificates of the foreign debt of Colombia, at the current market price on the day of delivery. It is understood that should the grantees forfeit this deposit by virtue of the provisions of clause 2, article 22, of

* This article modified by Colombian Congress. See decree which follows.

this contract, the said sum with its interest shall become the sole property of the Colombian Government. On the conclusion of the canal the amount deposited as security shall remain to the credit of the treasury as indemnity to the national government for the expenses incurred in the erection of buildings for the use of public offices.

ART. 3.* Should the route of the canal from one ocean to the other pass to the west and to the north of the imaginary straight line which connects Cape Tiburon with Garachine Point, the grantees must make a friendly arrangement with the Panama Railroad Company, or pay an indemnity which shall be determined in accordance with the provisions of law 46, of August 16, 1867, "which approves the contract celebrated July 5, 1867, reformatory of that of April 15, 1850, for the construction of a railroad from ocean to ocean, across the Isthmus of Panama."

In case the international commission selects the Atrato, or some other stream now navigable, as one of the entrances of the canal, the canalized mouth shall be considered as one of the parts of the principal work, and maintained in equally good condition. River navigation in the upper part of the stream, so far as it has not for its object the use of the canal, shall be open to commerce, and free from all dues.

ART. 4.* In addition to the lands granted by paragraphs 7 and 8 of article 1, there are gratuitously given to the grantees, and at their choice five hundred thousand hectares of the unoccupied public lands, with the mines which they may contain. This allotment shall be made directly by the national executive power. The public lands situated on the sea-coast, or on the border of the canal, or at the rivers, shall be divided as closely as possible in alternate lots between the government and the company, forming, if the ground will permit, areas of one and two thousand hectares. The measurement for the allotment or location shall be made at the cost of the grantees, and with the intervention of commissioners of the government.

Unoccupied lands so granted, with the mines which they may hold, shall be awarded to the grantees as soon as they request them after the deposit of the security. In a belt of two myriameters on each side of the canal, and during five years after the conclusion of the work, the government cannot transfer other lands beyond the said lots until the company shall have obtained the whole of the lands which are granted to it gratuitously.

ART. 5.* The government of the republic declares neutral, for all time, the ports of each terminus of the canal and the waters of the latter from one sea to the other, and consequently in case of war between other nations or between one or more of these and Colombia, the transit of the canal shall not be interrupted on that account, and the merchant vessels and individuals of all nations of the world may enter said ports, and navigate the canal without let or hinderance. In general any ship whatever may navigate the canal freely without discrimination, exclusion, or preference of persons or nationalities, by paying the dues and abiding by the regulations laid down by the company for the use of said canal and its dependencies. Exception is made of foreign troops, which cannot pass without permission from Congress.

ART. 6.* The entrance to the canal shall be rigorously prohibited to the war vessels of those nations which are at war with another or others, and whose destination manifests their intention to take part in hostilities.

ART. 7. The grantees will enjoy the right during the whole time of the privilege to use the ports at the termini of the canal, as well as intermediate points, for the anchorage and repair of ships, and the loading, depositing, transshipping, or landing of merchandise. The ports of the canal shall be open and free to the commerce of all nations, and no import duties shall be exacted except on merchandise destined to be introduced for the consumption of the rest of the republic. The said ports shall, therefore, be open to importations from the commencement of the work, and the custom-houses, and the revenue service which the government may deem convenient for the collection of duties on merchandise destined for other portions of the republic, shall be established, in order to prevent introduction of smuggled goods.

ART. 8.* The executive power shall issue the necessary regulations for the protection of its revenues by preventing smuggling, and shall appoint the number of men necessary for this service at its own expense. Of the employés indispensable for this, ten shall be paid by the company, and their salaries shall not exceed those paid to officials of the same grade in the custom-house at Barranquilla. When necessary, the company shall transport, free of charge, by the canal or by the auxiliary railroad, the men at the service of the union or destined for police duty, with the object of guarding public service without, or preserving public order within. If the company should not own ships or tugs, they shall pay the passage of these men across the isthmus. The sustenance of the public force necessary for the security of the interoceanic transit shall also be at the expense of the company.

ART. 9. The grantees shall have the right to introduce, free of import or other duties of whatever class, all the instruments, machinery, tools, fixtures, provisions, clothing for laborers, which they may need during all the time allowed to them for the con-

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*This article modified by Colombian Congress. See decree which follows.

struction and use of the canal. The ships carrying cargoes for the use of the enterprise shall enjoy free entry to whatever points shall affords them easy access to the line of the canal.

ART. 10. No taxes, either national, municipal, of the State, or of any other class, shall be levied upon the canal, the ships that navigate it, the tugs and vessels at the service of the grantees, their warehouses, work-shops, and offices, factories of whatever class, storehouses, wharves, machinery, or other works or property of whatever character belonging to them, and which they may need for the service of the canal and its dependencies, during the time conceded for its construction and operation. The grantees shall also have the right to take from unoccupied lands the materials of any kind which they may require without paying any compensation for the same.

ART. 11. The passengers, money, precious metals, merchandise, and articles and effects of all kinds which may be transported over the canal, shall also be exempt from all duties, national, municipal, transit and others. The same exemption is extended to all articles and merchandise for interior or exterior commerce which may remain in deposit, according to the conditions which may be stipulated, with the company in the storehouses and stations belonging to them.

ART. 12. Ships desiring to cross the canal shall present at the port of the terminus of the canal at which they may arrive, their respective registers and other sailing papers, prescribed by the laws and public treaties, so that the vessels may navigate without interruption. Vessels not having said papers, or which should refuse to present them, may be detained and proceeded against according to law.

ART. 13.* The government allows the immigration and free access to the lands and work-shops of the grantees of all employés and laborers, of whatever nationality, contracted for the enterprise, or who may come to engage themselves in the service of the canal, on condition that such employés or laborers submit to existing laws, and to the regulations established by the company. The government assures them aid and protection and the enjoyment of their rights and privileges, according to the constitution and laws of the nation, during the time they live in Colombian territory.

ART. 14.* As a compensation to the grantees for the expenses of the building, preservation and operation of the canal, which are for their account, they shall have the right during all the period of this privilege to charge and collect for passage over the canal, and the ports dependent upon it, dues for light-house, anchorage, transit, navigation, repairs, pilotage, towing, hauling, storage, and station, as per the tariff they may establish, and which may be modified at any time under the following express conditions:

1st. These dues shall be imposed without exception or favor upon all ships in identical conditions.

2d. The tariff shall be published four months before going into operation in the Diario Oficial of the government, as well as in the capitals and principal commercial ports of the countries affected thereby.

3d. The principal dues to be collected on vessels shall not exceed the rate of ten francs for each cubic meter, resulting from the multiplication of the principal dimensions of the submerged portion of the ship in transit (length, breadth, and draught).

4th. The principal dimensions of the ship in transit, that is to say, the greatest exterior length and beam of vessel, as well as the greatest draught of water, shall be nautical dimensions, inserted in the official clearance papers, with the exception of such modifications as may result in the course of the voyage. The captains of ships and agents of the company may require a new measurement to be taken, which operation shall be effected at the expense of the solicitor.

5th. The same measurement, that is to say, the parallelopiped described by the submerged part of the ship, shall serve as the basis for the determination of the other accessory charges.

6th. Special dues for navigation shall be reduced in proportion to the excess when the net profits derived therefrom shall exceed 12 per cent. of the capital employed in the enterprise.

ART. 15*. By way of compensation for the right and exemptions which are conferred upon the grantees by this contract, the government of the republic shall enjoy a participation equal to 5 per cent. of the gross earning which shall accrue to the enterprise, as per the tariff to be fixed by the company.

ART. 16. The grantees are authorized to require payment in advance of any charges which they may establish; nine-tenths of these charges shall be made payable in gold, and only the remaining one-tenth part shall be payable in silver of twenty-five grammes, of a fineness of 900.

ART. 17. The ships which shall infringe upon the rules established by the company shall be subject to the payment of a fine, which said company shall fix in its regulations, of which due notice shall be given to the public at the time of the issue of the tariff. Should they refuse to pay said fine, nor furnish sufficient security, they may

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* This article modified by Colombian Congress. See decree which follows.

be detained and prosecuted according to the laws. The same proceedings may be observed for the damages they may have caused.

ART. 18. If the opening of the canal shall be deemed financially possible, the grantees are authorized to form, under the immediate protection of the Colombian Government, a universal joint-stock company, which shall undertake the execution of the work, taking charge of all financial transactions which may be needed. As this enterprise is essentially international, and for public utility, it is understood that it shall always be kept free from political influences.

The company shall take the name of "The Universal Interoceanic Canal Association"; its residence shall be fixed in Bogota, New York, London, or Paris, as the grantees may choose; branch offices may be established wherever necessary. Its contracts, shares, bonds, and titles of its property shall never be subjected by the Government of Colombia to any charges for registry, emission, stamps, or any similar imposts upon the sale or transfer of these shares or bonds, as well as on the profits produced by these values.

ART. 19. The company is authorized to reserve as much as 10 per cent. of the shares emitted, to form a fund of shares, to the benefit of the founders and promoters of the enterprise. Of the products of the concern, the company take, in the first place, what is necessary to cover all expenses of repairs, operations, and administration, and the share which belongs to the government, as well as the sums necessary for the payment of the interest and the amortization of the bonds, and, if possible the fixed interest or dividend of the shares; that which remains will be considered as net profit, out of which 80 per cent. at least will be divided among the shareholders.

ART. 20.* The Colombian Government, should it consider it important, may name a special commissioner in the board of directors of the company. This delegate shall enjoy all the advantages conceded to the other directors by the statutes of the company. The grantees are obliged to appoint in Bogota, near the national government, an agent duly authorized to resolve all doubts and to present all demands to which this contract may give rise. Reciprocally, and with the same intention, the government shall name a resident agent in the principal establishment of the company on the canal. In every case the difficulties which may arise between the contracting parties shall be submitted to a committee of arbitrators, composed of four individuals, two of whom shall be selected by the executive power from among the members of the federal supreme court, and the other two named by the company. In case of a tie in the votes of this committee, the said arbitrators shall name a fifth party. The decision pronounced by this tribunal shall be final.

ART. 21. The grantees, or those who in future may succeed them in their rights, may transfer those rights to other capitalists or financial companies, but it is absolutely prohibited to cede or mortgage them under any considerations whatever to any nation or foreign government.

ART. 22.* The grantees or their representatives shall forfeit their acquired rights in the following cases:

1st. If they do not deposit within the term stipulated the amount required as security for the execution of the work.

2d. If in the first of the twelve years allowed for the construction of the canal the work is not already begun. In this case the company shall forfeit the sum deposited as a guarantee, and which shall go to the benefit of the republic.

3d. If at the termination of the period fixed by paragraph fifth of article one, the canal is not navigable.

4th. If they do not comply with the provisions of article 21.

5th. If the service of the canal should be interrupted without some superhuman obstacle.

In cases 2, 3, 4, and 5, the federal supreme court shall decide whether the privilege has become null or not.

ART. 23.* In all cases of declaration of nullity, the public lands mentioned in paragraphs 7 and 8 of article 1, and those not alienated among those conceded in article 4, will return to the possession of the republic in the state in which they are found, and without any indemnity whatever, and also the buildings, materials, works, and improvements of which the grantees hold possession in the canal. These shall reserve only their capital, vessels, provisions, and, in general, their movable property.

ART. 24. Five years previous to the expiration of the ninety-nine years of the privilege, the executive power shall appoint a commissioner to examine the condition of the canal and annexes, and, with the knowledge of the company or its agents on the isthmus, to make an official report, describing in every detail the condition of the same and pointing out what repairs may be necessrry. This report will serve to establish in what condition the canal and its dependencies shall be delivered to the national government on the day of expiration of the privilege now granted.

ART. 25. The enterprise of the canal is reputed to be of public utility.

ART. 26. This contract, which will serve as a substitute for the provisions of law 33,

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* This article modified by Colombian Government. See decree which follows.

of May 26, 1876, and the clauses of the contract celebrated on the 28th of May of the same year, shall be submitted for the approval of the President of the union and the definite acceptance by the Congress of the nation.

In witness whereof they sign the present in Bogota, on the 20th March, 1878.

EUSTORGIO SALGAR.
LUCIEN N. B. WYSE.

BOGOTA, *March* 23, 1878.

Approved.
The President of the union:

AQUILEO PARRA.

The secretary of the interior and of foreign relations:

EUSTORGIO SALGAR.

DECREES.

The foregoing contract is hereby approved, with the following modifications:

Article 1, with the addition of the following paragraph:

§—It is, however, stipulated and agreed that if, before the payment of the security determined upon in article 2, the Colombian Government should receive any formal proposal, sufficiently guaranteed, in the opinion of the said government, to construct the canal in less time and under more advantageous conditions for the United States of Colombia, said proposal shall be communicated to the grantees or their representatives, that they may be substituted therein, in which case they shall be preferred; but if they do not accept said substitution, the Colombian Government, in the new contract which they may celebrate, shall exact, besides the guarantee mentioned in article 2, the sum of three hundred thousand dollars in coin, which shall be given as indemnity to the grantees.

Article 2, thus:

ART. 2. Within the term of twelve months from the date at which the international commission shall have presented the definite results of their studies, the grantees shall deposit in the bank or banks of London, to be designated by the national executive power, the sum of seven hundred and fifty thousand francs, to the exclusion of all paper money, as security for the execution of the work. The receipt of said banks shall be a voucher for the fulfillment of said deposit. It is understood that if the grantees should lose that deposit by virtue of the stipulations contained in clauses 2 and 3 of article 22 of the present contract, the sum referred to, with interest accrued, shall become *in toto* the property of the Colombian Government. After the conclusion of the canal, said sum, without interest, which latter will in this case belong to the grantees, shall remain for the benefit of the treasury, for the outlays which it may have incurred or may incur in the construction of buildings for the service of the public officers.

Article 3, thus:

ART. 3. If the line of the canal to be constructed from sea to sea should pass to the west and to the north of the imaginary straight line which joins Cape Tiburon with Garachiné Point, the grantees must enter into some amicable arrangement with the Panama Railroad Company, or pay an indemnity, which shall be established in accordance with the provisions of law 46, of August 16, 1867, 'approving the contract celebrated on July 5, 1867, reformatory of the contract of April 15, 1850, for the construction of an iron railroad from one ocean to the other through the Isthmus of Panama.'

In case the international commissions should choose the Atrato or some other stream already navigable as one of the entrances to the canal, the ingress and egress by such stream, and the navigation of its waters, so long as it is not intended to cross the canal shall be open to commerce and free from all imposts.

Article 4, thus:

ART. 4. Besides the lands granted in paragraphs 7 and 8 of article 1, there shall be awarded to the grantees, as an aid for the accomplishment of the work, and not otherwise, five hundred thousand hectares of public lands, with the mines they may comprise, in the localities which the company may select. This award shall be made directly by the national executive power. The public lands situated on the sea-coast, on the borders of the canal or of the rivers, shall be divided in alternate lots between the government and the company, forming areas of from one to two thousand hectares. The measurements for the allotment or locating shall be made at the expense of the grantees, and with the intervention of government commissioners. The public lands thus granted, with the mines they may hold, shall be awarded to the grantees

as fast as the work of construction of the canal progresses, and in accordance with rules to be laid down by the executive power.

Within a belt of two myriameters on each side of the canal, and during five years after the termination of the work, the government shall not have the right to grant other lands beyond the said lots until the company shall have called for the whole number of lots granted by this article.

Article 5, thus:

ART. 5. The government of the republic hereby declares the ports at each end of the canal, and the waters of the latter from sea to sea, to be neutral for all time; and consequently, in case of war among other nations, the transit through the canal shall not be interrupted by such event, and the merchant vessels and individuals of all nations of the world may enter into said ports and travel on the canal without being molested or detained. In general, any vessel may pass freely without any discrimination, exclusion, or preference of nationalities or persons, on payment of the dues and the observance of the rules established by the company for the use of the canal and its dependencies. Exception is to be made of foreign troops, which shall not have the right to pass without permission from Congress, and of the vessels of nations which, being at war with the United States of Colombia, may not have obtained the right to pass through the canal at all times, by public treaties wherein is guaranteed the sovereignty of Colombia over the Isthmus of Panama and over the territory whereon the canal is to be cut, besides the immunity and neutrality of the said canal, its ports, bays, and dependencies, and the adjacent seas.

Article 6, thus:

ART. 6. The United States of Colombia reserves to themselves the right to pass their vessels, troops, ammunitions of war at all times and without paying any dues whatever. The passage of the canal is strictly closed to war vessels of nations at war with another or other nations, and which may not have acquired, by public treaty with the Colombian Governments, the right to pass by the canal at all times.

Article 8, thus:

ART. 8. The executive power shall dictate, for the protection of the financial interests of the republic, the regulations conducive to the prevention of smuggling, and shall have the power to station, at the cost of the nation, the number of men which they may deem necessary for that service.

Out of the indispensable officials for that service, ten shall be paid by the company, and their salaries shall not exceed those enjoyed by employés of the same rank in the Barranquilla custom-house.

The company shall carry gratis through the canal, or on the auxiliary railway, the men destined for the service of the nation, for the service of the state through whose territory the canal may pass, or for the service of the police, with the object of guarding against foreign enemies, or for the preservation of public order, and shall also transport gratis the baggage of such men, their war materials, armament, and clothing which they may need for the service assigned to them.

The subsistence of the public force which may be deemed necessary for the safety of the interoceanic transit shall likewise be at the expense of the company.

Article 13, thus:

ART. 13. The government allows the immigration and free access to the lands and shops of the grantees of all the employés and workingmen of whatever nationality, who may be contracted for the work, or who may come to engage themselves to work on the canal, on condition that such employés or laborers shall submit to the existing laws, and to the regulations established by the company. The government promises them support and protection, and the enjoyment of their rights and guarantees, in conformity with the national constitution and laws, during the time they may sojourn on Colombian territory.

The *national peons* and laborers employed on the work of the canal shall be exempt from all requisition of military service, national as well as of the state.

Article 14, thus:

ART. 14. In order to indemnify the *grantees* of the construction, maintenance, and working expenses incurred by them, they shall have, during the whole period of the privilege, the exclusive right to establish and collect for the passage of the canal and its ports, the dues for light-houses, anchorage, transit, navigation, repairs, pilotage, towage, hauling, stowage, and of station according to the tariff which they may issue, and which they may modify at any time under the following express conditions:

1st. They shall collect these dues, without any exceptional favor, from all vessels in like circumstances.

2d. The tariffs shall be published four months before their enforcement in the Diario Oficial of the government, as well as in the capitals and the principal commercial ports of the countries interested.

3d. The principal navigation dues to be collected shall not exceed the sum of ten francs for each cubic meter resulting from the multiplication of the principle dimensions of the submerged part of the ship in transit (length, breadth, and draught).

4th. The principal dimensions of the ship in transit, that is to say, the maximum exterior length and breadth at the water-line, as well as the greatest draught, shall be the metrical dimension inserted in the official clearance papers, excepting any modifications supervening during the voyage. The ships' captains and the company's agents may demand a new measurement, which operations shall be carried out at the expense of the petitioner; and

5th. The same measurement, that is to say, the number of cubic meters contained in the parallelopipedon circumscribing the submerged part of the ship, shall serve as a basis for the determination of the other accessory dues.

Article 15, thus:

ART. 15. By way of compensation for the rights and exemptions which are allowed to the grantees in this contract, the government of the republic shall be entitled to a share amounting to five per cent. on all collections made by the company, by virtue of the dues which may be imposed in conformity with Article 14, during the first twenty-five years after the opening of the canal to the public service. From the twenty-sixth up to the fiftieth year, inclusive, it shall be entitled to a share of (6%) six per cent; from the fifty-first to the seventy-fifth to seven per cent; and from the seventy-sixth to the termination of the privilege to eight per cent. It is understood that these shares shall be reckoned, as has been said, on the gross income from all sources, without any deductions whatever for expenses, interest on shares, or on loans or debts against the company. The government of the republic shall have the right to appoint a commissioner or agent, who shall intervene in the collections and examine the accounts, and the distribution or payment of the shares coming to the government shall be made in due half-yearly installments. The product of the five, six, seven and eight per cent. shall be distributed as follows:

Four-fifths of it shall go to the government of the republic, and the remaining one-fifth to the government of the state through whose territory the canal may pass.

The company guarantees to the Government of Colombia that the share of the latter shall in no case be less than the sum of two hundred and fifty thousand dollars a year, which is the same as that received as its share in the earnings of the Panama Railroad, so that if in any year the five per cent. share should not reach said sum, it shall be completed out of the common funds of the company.

Article 20, thus:

ART. 20. The Colombian Government may appoint a special delegate in the board of directors of the company whenever it may consider it useful to do so. This delegate shall enjoy the same advantages as are granted to the other directors by the by-laws of the company.

The grantees pledge themselves to appoint in the capital of the union, near the national government, a duly-authorized agent for the purpose of clearing up all doubts and presenting any claims to which this contract may give rise. Reciprocally and in the same sense, the government shall appoint an agent, who shall reside in the principal establishment of the company situated on the line of the canal; and, according to the national constitution, the difficulties which may arise between the contracting parties shall be submitted to the decision of the federal supreme court.

Article 22, thus:

ART. 22. The grantees, or their representatives, shall lose the right hereby acquired in the following cases:

1st. If they do not deposit, on the terms agreed upon, the sum which by way of security must insure the execution of the work.

2d. If, in the first year of the twelve that are allowed for the construction of the canal, the works are not already commenced, in this case the company shall lose the sum deposited by way of security, together with the interest that may have accrued; all of which will remain for the benefit of the republic.

3d. If, at the end of the second period fixed in paragraph 5 of Article 1, the canal is not transitable, in this case also the company shall lose the sum deposited as security; which, with the interests accrued, shall remain for the benefit of the republic.

4th. If they violate the prescriptions of Article 21; and,

5th. If the service of the canal should be interrupted for a longer period than six months without its being occasioned by the acts of God, &c.

In cases 2, 3, 4, and 5, the federal supreme court shall have the right to decide whether the privilege has become annulled or not.

Article 23, thus:

ART. 23. In all cases of decisions of nullity, the public lands mentioned in clauses 7 and 8 of Article 1, and such lands as are not settled or inhabited from among those granted by Article 4, shall revert to the possession of the republic in the condition they may be found in, and without any indemnity whatever, as well as the buildings, materials, works, and improvements which the grantees may possess along the canal and its accessories. The grantees shall only retain their capital, vessels, provisions, and in general all movable property.

Given at Bogota on the seventeenth day of May, eighteen hundred and seventy-eight.

The president of the senate of plenipotentiaries:

RAMON GOMEZ.

The president of the chamber of representatives:

BELISARIO ESPONDA.

The secretary of the senate of plenipotentiaries:

JULIO E. PEREZ.

The secretary of the chamber of representatives:

ENRIQUE GAONA.

BOGOTA, *May* 18, 1878.

Let it be published and enforced.

The President of the Union:

[SEAL.] JULIAN TRUJILLO.

The secretary of the interior and foreign relations:

FRANCISCO J. ZALDUA.

Note from Mr. Lucien N. B. Wyse, wherein he declares he accepts all the modifications made by law 28 to the contract for the construction of the interoceanic canal.

To the honorable Secretary of the Interior and Foreign Relations:

I have the honor to inform you that I accept each and all of the modifications introduced by Congress to the contract which I celebrated with Señor Enstorgio Salgar, your worthy predecessor in the department of the interior and foreign relations, for the construction of the interoceanic canal, which contract was approved by the executive power under date of March 23 last.

The modifications to which I have alluded are those recorded in law No. 28 of the 18th instant.

I hasten to lay this declaration before the Government of Colombia, so that it may be taken in consideration, in order that said law may be effective in all its parts.

BOGOTA, May 18, 1878.

LUCIEN N. B. WYSE,

Chief of the International Scientific Commission for the Survey of the Isthmus, Member and Delegate from the Board of Directors of the Interoceanic Canal Association.

68.—*Mr. Blaine to Mr. Lowell.*

No. 187.] DEPARTMENT OF STATE,
Washington, June 24, 1881.

SIR: It has fallen under the observation of the President, through the current statements of the European press and other usual channels of communication, that the great powers of Europe may possibly be considering the subject of jointly guaranteeing the neutrality of the interoceanic canal now projected across the Isthmus of Panama.

The United States recognizes a proper guarantee of neutrality as essential to the construction and successful operation of any highway across the Isthmus of Panama, and in the last generation every step was taken by this government that is deemed requisite in the premises. The necessity was foreseen and abundantly provided for, long in advance of any possible call for the actual exercise of power.

In 1846 a memorable and important treaty was negotiated and signed between the United States of America and the Republic of New Granada, now the United States of Colombia. By the thirty-fifth article of that treaty, in exchange for certain concessions made to the United States, we guaranteed "positively and efficaciously" the perfect neutrality of the isthmus and of any interoceanic communications that might be constructed upon or over it for the maintenance of free transit from sea to sea; and we also guaranteed the rights of sovereignty and property of the United States of Colombia over the territory of the isthmus as included within the borders of the State of Panama.

In the judgment of the President this guarantee, given by the United States of America, does not require re-enforcement, or accession, or assent from any other power. In more than one instance this government has been called upon to vindicate the neutrality thus guaranteed, and there is no contingency, now foreseen or apprehended, in which such vindication would not be within the power of this nation.

There has never been the slightest doubt on the part of the United States as to the purpose or extent of the obligation then assumed, by which it became surety alike for the free transit of the world's commerce over whatever land-way or water-way might be opened from sea to sea, and for the protection of the territorial rights of Colombia from aggression or interference of any kind. Nor has there ever been room to question the full extent of the advantages and benefits, naturally due to its geographical position and political relations on the Western continent, which the United States obtained from the owner of the isthmian territory in exchange for that far-reaching and responsible guarantee.

If the foreshadowed action of the European powers should assume tangible shape, it would be well for you to bring to the notice of Lord Granville the provisions of the treaty of 1846, and especially of its thirty-fifth article, and to intimate to him that any movement in the sense of supplementing the guarantee contained therein would necessarily be regarded by this government as an uncalled-for intrusion into a field where the local and general interests of the United States of America must be considered before those of any other power save those of the United States of Colombia, alone, which has already derived and will continue to derive such eminent advantages from the guarantee of this government.

The President deems it due to frankness to be still more explicit on this subject, and to elucidate the views of the United States Government with somewhat of detail, to the end that no uncertainty shall subsist as to the integrity of our motives or the distinctness of our aims.

It is not the wish or the purpose of the United States to interfere with any commercial enterprise in which the citizens or subjects of any foreign power may see fit to embark under a lawful privilege. The fact of the stock and franchises of the Panama Canal or the Panama Railway being owned in Europe, either in whole or principally, is no more a subject of complaint on the part of the United States than is the circumstance that the stock of many of its own great lines of railway is largely held abroad. Such ownership, with its attendant rights, is in the United States amply secured by the laws of the land, and on the Isthmus is doubly secured by the local laws of Colombia, under the superior guarantee of the United States.

Nor, in time of peace, does the United States seek to have any exclusive privileges accorded to American ships in respect to precedence or tolls through an interoceanic canal any more than it has sought like privileges for American goods in transit over the Panama Railway, under the exclusive control of an American corporation. The extent of the privileges of American citizens and ships is measurable under the treaty of 1846 by those of Colombian citizens and ships. It would be our earnest desire and expectation to see the world's peaceful commerce enjoy the same just, liberal, and rational treatment.

It is as regards the political control of such a canal, as distinguished from its merely administrative or commercial regulation, that the President feels called upon to speak with directness and with emphasis. During any war to which the United States of America or the United

States of Colombia might be a party, the passage of armed vessels of a hostile nation through the canal of Panama would be no more admissible than would the passage of the armed forces of a hostile nation over the railway lines joining the Atlantic and Pacific shores of the United States or of Colombia. And the United States of America will insist upon her right to take all needful precautions against the possibility of the isthmus transit being in any event used offensively against her interests upon the land or upon the sea.

The two republics between which the guarantee of neutrality and possession exists have analogous conditions with respect to their territorial extension. Both have a long line of coast on either ocean to protect as well as to improve. The possessions of the United States upon the Pacific coast are imperial in extent and of extraordinary growth. Even at their present stage of development they would supply the larger part of the traffic which would seek the advantages of the canal. The States of California and Oregon, and the Territory of Washington, larger in area than England and France, produce for export more than a ton of wheat for each inhabitant, and the entire freights demanding water transportation eastward, already enormous, are augmenting each year with an accelerating ratio. While the population and products of the Pacific slope are thus increasing upon a vast scale, the railway system connecting the Gulf of Mexico with the interior and with the Great Lakes is being rapidly extended, thus affording additional facilities for enlarging the commerce that must seek the coast-line to the Pacific, of which the projected canal at Panama will form a part, and be as truly a channel of communication between the Eastern and far Western States as our own transcontinental railways. It is the perception of this domestic function of the long-sought water-way between the two seas that border the republic which has caused the project to be regarded as of vital importance by this government. The history of the enterprise is marked from the outset by the numerous expeditions which have, from time to time, been sent out by the United States at large expense to explore the various routes, and thus facilitate the work when the time should be ripe and the vast capital be forthcoming for the undertaking.

If the proposed canal were a channel of communication near to the countries of the Old World, and employed wholly, or almost wholly, by their commerce, it might very properly be urged that the influence of the European powers should be commensurate with their interests. With the exercise of such influence the United States could find no fault, especially if assured of equal participation in the peaceable enjoyment of the commercial facilities so afforded. The case, however, is here reversed, and an agreement between the European states to jointly guarantee the neutrality and in effect control the political character of a highway of commerce, remote from them and near to us, forming substantially a part of our coast-line and promising to become the chief means of transportation between our Atlantic and Pacific States, would be viewed by this government with the gravest concern.

The policy of the United States is one of peace and friendly intercourse with every government and people. This disposition is frankly avowed, and is, moreover, abundantly shown in the fact that our armaments by land and sea are kept within such limits as to afford no ground for distrust or suspicion of menace to other nations. The guarantee entered into by this government in 1846 was manifestly in the interest of peace, and the necessity imposed by circumstances upon the United States of America to watch over a highway between its two coasts was so imperative that the resultant guarantee was the simplest justice to the chief interests concerned. Any attempt to supersede that guaran-

tee by an agreement between European powers, which maintain vast armies and patrol the sea with immense fleets, and whose interest in the canal and its operations can never be so vital and supreme as ours, would partake of the nature of an alliance against the United States, and would be regarded by this government as an indication of unfriendly feeling. It would be but an inadequate response to the good-will we bear them and to our cheerful and constant recognition of their own rights of domestic policy, as well as those resulting from proximity or springing from neighborly interest.

The great European powers have repeatedly united in agreements such as guarantees of neutrality touching the political condition of states like Luxembourg, Belgium, Switzerland, and parts of the Orient, where the localities were adjacent or where the interests involved concerned them nearly and deeply. Recognizing these facts, the United States has never offered to take part in such agreements or to make any agreements supplementary to them.

While thus observing the strictest neutrality with respect to complications abroad, it is the long-settled conviction of this government that any extension to our shores of the political system by which the great powers have controlled and determined events in Europe would be attended with danger to the peace and welfare of this nation.

While the Government of the United States has no intention of initiating any discussion upon this subject, it is proper that you should be prepared, in case of concerted action or conference or exchange of opinions thereon between the great powers of Europe, to communicate to the government to which you are accredited the views of the President as frankly and as fully as they are herein set forth. And at suitable times in your personal and friendly intercourse with your colleagues of the diplomatic body at London, you may find it proper to give discreet expression to the policy and motives of your government in the premises.

You will be careful, in any conversations you may have, not to represent the position of the United States as the development of a new policy or the inauguration of any advanced, aggressive steps to be taken by this government. It is nothing more than the pronounced adherence of the United States to principles long since enunciated by the highest authority of the government, and now, in the judgment of the President, firmly inwoven as an integral and important part of our national policy.

In his address upon taking the oath of office the President distinctly proclaimed the position which the Government of the United States would hold upon this question, and if the European cabinets have failed to observe or give due heed to the declarations then made, it may be well for you on some proper occasion to call the attention of the minister of foreign affairs to the language used by the President.

I am, &c.,

JAMES G. BLAINE.

Sent *mutatis mutandis* to the United States ministers in Europe.

69.—*Mr. Hoppin to Mr. Blaine.*

No. 218.] LEGATION OF THE UNITED STATES,
London, November 11, 1881. (Received November 26.)

SIR: Referring to your instructions No. 187, of the 24th of June last, and No. 188, of the 25th of June last, to Mr. Lowell, in relation to the

proposed guarantee by European powers of the neutrality of the projected canal across the Isthmus of Panama, I have the honor to acquaint you that Mr. Lowell, agreeably to the suggestion in No. 187, left a copy of that instruction at the foreign office on the 12th of July last. I have to-day received a letter from Lord Granville in reply to that instruction, and I beg to inclose a copy of the same herewith.

I have, &c.,

W. J. HOPPIN.

[Inclosure with No. 218.]

Lord Granville to Mr. Hoppin.

FOREIGN OFFICE, *November* 10, 1881.

SIR: You are doubtless aware that Mr. Lowell left with this department on the 12th of July last a copy of a dispatch which had been addressed to him by Mr. Blaine on the 24th of June, in which the Secretary of State calls attention to the right and duty which are imposed on the United States Government under the treaty signed in 1846 between the United States of America and the Republic of New Granada, now known as the United States of Colombia, to guarantee the neutrality of the interoceanic canal which is projected across the Isthmus of Panama. Mr. Blaine further points out the special interest which the United States have in the preservation of this neutrality, and in preventing the use of the canal in a manner detrimental to themselves during any war in which the United States or Colombia might be a party.

But the point on which special stress is laid in this dispatch is the objection entertained by the Government of the United States to any concerted action of the European powers for the purpose of guaranteeing the neutrality of the canal or determining the conditions of its use.

I have now the honor to state to you that although some time has elapsed since the views of the United States Government on this question were communicated to Her Majesty's Government, they have not failed in the mean while to bestow upon it all the consideration to which the importance of the subject gives it every claim, and if it has not received an earlier recognition the delay has been mainly caused by the suspense which so long existed as to the termination of the sad tragedy of the 2d of July.

Her Majesty's Government have noted with satisfaction the statement made by Mr. Blaine that there is no intention on the part of the Government of the United States to initiate any discussion upon this subject, and in the same spirit I do not now propose to enter into a detailed argument in reply to Mr. Blaine's observations.

I should wish, therefore, merely to point out to you that the position of Great Britain and the United States with reference to the canal, irrespective of the magnitude of the commercial relations of the former power with countries to and from which, if completed, it will form the highway, is determined by the engagements entered into by them, respectively, in the convention which was signed at Washington on the 19th of April, 1850, commonly known as the Clayton-Bulwer treaty, and Her Majesty's Government rely with confidence upon the observance of all the engagements of that treaty.

I have, &c.,

GRANVILLE.

70.—*Mr. Blaine to Mr. Lowell.*

270.] DEPARTMENT OF STATE,
Washington, November 19, 1881.

SIR: In pursuance of the premises laid down in my circular note of June 24 of this year touching the determination of this government with respect to the guarantee of neutrality for the interoceanic canal at Panama, it becomes my duty to call your attention to the convention of April 19, 1850, between Great Britain and the United States, commonly known as the Clayton-Bulwer treaty.

According to the articles of that convention the high contracting parties, in referring, to an interoceanic canal through Nicaragua, agreed "that

neither the one nor the other will ever obtain or maintain for itself any exclusive control over said ship-canal, and that neither will ever erect or maintain any fortifications commanding the same or in the vicinity thereof." In a concluding paragraph the high contracting parties agreed "to extend their protection by treaty stipulations to any other practical communications, whether by canal or railway, across the Isthmus * * * which are now proposed to be established by way of Tehuantepec or Panama."

This convention was made more than thirty years ago, under exceptional and extraordinary conditions which have long since ceased to exist—conditions which at best were temporary in their nature, and which can never be reproduced.

The remarkable development of the United States on the Pacific coast since that time has created new duties for this government, and devolved new responsibilities upon it, the full and complete discharge of which requires in the judgment of the President some essential modifications in the Clayton-Bulwer treaty. The interests of Her Majesty's Government involved in this question, in so far as they may be properly judged by the observation of a friendly power, are so inconsiderable in comparison with those of the United States that the President hopes a readjustment of the terms of the treaty may be reached in a spirit of amity and concord.

The respect due to Her Majesty's Government demands that the objections to the perpetuity of the convention of 1850, as it now exists, should be stated with directness and with entire frankness. And among the most salient and palpable of these is the fact that the operation of the treaty practically concedes to Great Britain the control of whatever canal may be constructed.

The insular position of the home government, with its extended colonial possessions, requires the British Empire to maintain a vast naval establishment, which, in our continental solidity, we do not need, and in time of peace shall never create. If the United States binds itself not to fortify on land, it concedes that Great Britain, in the possible case of a struggle for the control of the canal, shall at the outset have an advantage which would prove decisive, and which could not be reversed except by the expenditure of treasure and force. The presumptive intention of the treaty was to place the two powers on a plane of perfect equality, with respect to the canal, but in practice, as I have indicated, this would prove utterly delusive, and would instead surrender it, if not in form, yet in effect, to the control of Great Britain.

The treaty binds the United States not to use its military force in any precautionary measure, while it leaves the naval power of Great Britain perfectly free and unrestrained; ready at any moment of need to seize both ends of the canal, and render its military occupation on land a matter entirely within the discretion of Her Majesty's Government.

The military power of the United States, as shown by the recent civil war, is without limit, and in any conflict on the American continent altogether irresistible. The Clayton-Bulwer treaty commands this government not to use a single regiment of troops to protect its interests in connection with the interoceanic canal, but to surrender the transit to the guardianship and control of the British navy. If no American soldier is to be quartered on the Isthmus to protect the rights of his country in the interoceanic canal, surely, by the fair logic of neutrality, no war vessel of Great Britain should be permitted to appear in the waters that control either entrance to the canal.

A more comprehensive objection to the treaty is urged by this govern-

ment. Its provisions embody a misconception of the relative positions of Great Britain and the United States with respect to the interests of each government in questions pertaining to this continent. The Government of the United States has no occasion to disavow an aggressive disposition. Its entire policy establishes its pacific character, and among its chief aims is to cultivate the most friendly and intimate relations with its neighbors, both independent and colonial. At the same time, this government, with respect to European states, will not consent to perpetuate any treaty that impeaches our right and long-established claim to priority on the American continent.

The United States seeks only to use for the defense of its own interests the same forecast and provision which Her Majesty's Government so emphatically employs in defense of the interests of the British Empire. To guard her Eastern possessions, to secure the most rapid transit for troops and munitions of war, and to prevent any other nation having equal facilities in the same direction, Great Britain holds and fortifies all the strategic points that control the route to India. At Gibraltar, at Malta, at Cyprus, her fortifications give her the mastery of the Mediterranean. She holds a controlling interest in the Suez Canal, and by her fortifications at Aden and on the island of Perim she excludes all other powers from the waters of the Red Sea and renders it a *mare clausum*. It would, in the judgment of the President, be no more unreasonable for the United States to demand a share in these fortifications, or to demand their absolute neutralization, than for England to make the same demand in perpetuity from the United States with respect to the transit across the American continent. The possessions which Great Britain thus carefully guards in the East are not of more importance to her than is the Pacific slope, with its present development and assured growth, to the Government of the United States.

The States and Territories appurtenant to the Pacific Ocean and dependent upon it for commercial outlet, and hence directly interested in the canal, comprise an area of nearly eight hundred thousand square miles, larger in extent than the German Empire and the four Latin countries of Europe combined.

This vast region is but fairly beginning its prosperous development. Six thousand miles of railway are already constructed within its limits, and it is a moderate calculation to say that within the current decade the number of miles will at least be doubled. In the near future the money value of its surplus for export will be as large as that of British India, and perhaps larger. Nor must it be forgotten that India is but a distant colony of Great Britain, while the region on the Pacific is an integral portion of our national Union, and is of the very form and body of our state. The inhabitants of India are alien from England in race, language, and religion. The citizens of California, Oregon, and Nevada, with the adjacent Territories, are of our own blood and kindred —bone of our bone and flesh of our flesh.

Great Britain appreciates the advantage and perhaps the necessity of maintaining, at the cost of large military and naval establishments, the interior and nearest route to India, while any nation with hostile intent is compelled to take the longer route and travel many thousand additional miles through dangerous seas. It is hardly conceivable that the same great power which considers herself justified in taking these precautions for the safety of a remote colony on another continent should object to the United States adopting similar but far less demonstrative measures for the protection of the distant shores of her own domain, for the drawing together of the extremes of the Union in still closer bonds

of interest and sympathy, and for holding, in the quiet determination of an honorable self-defense, the absolute control of the great waterway which shall unite the two oceans, and which the United States will always insist upon treating as part of her coast line.

If a hostile movement should at any time be made against the Pacific coast, threatening danger to its people and destruction to its property, the Government of the United States would feel that it had been unfaithful to its duty and neglectful towards its own citizens if it permitted itself to be bound by a treaty which gave the same right through the canal to a war-ship bent on an errand of destruction that is reserved to its own navy, sailing for the defense of our coast and the protection of the lives of our people. And as England insists by the might of her power that her enemies in war shall strike her Indian possessions only by doubling the Cape of Good Hope, so the Government of the United States will equally insist that the interior, more speedy, and safer route of the canal shall be reserved for ourselves, while our enemies, if we shall ever be so unfortunate as to have any, shall be remanded to the voyage around Cape Horn.

A consideration of controlling influence in this question is the well-settled conviction on the part of this government that only by the United States exercising supervision can the Isthmus canals be definitely and at all times secured against the interference and obstruction incident to war. A mere agreement of neutrality on paper between the great powers of Europe might prove ineffectual to preserve the canal in time of hostilities. The first sound of a cannon in a general European war would in all probability annul the treaty of neutrality, and the strategic position of the canal, commanding both oceans, might be held by the first naval power that could seize it. If this should be done the United States would suffer such grave inconvenience and loss in her domestic commerce as would enforce the duty of a defensive and protective war on her part for the mere purpose of gaining that control which in advance she insists is due to her position and demanded by her necessities.

I am not arguing or assuming that a general war, or any war at all, is imminent in Europe. But it must not be forgotten that within the past twenty-five years all the great powers of Europe have been engaged in war; most of them more than once. In only a single instance in the past hundred years has the United States exchanged a hostile shot with any European power. It is in the highest degree improbable that for a hundred years to come even that experience will be repeated.

It consequently becomes evident that the one conclusive mode of preserving any Isthmus canal from the possible distraction and destruction of war is to place it under the control of that government least likely to be engaged in war, and able, in any and every event, to enforce the guardianship which she shall assume.

For self-protection to her own interests, therefore, the United States in the first instance asserts her right to control the Isthmus transit. And, secondly, she offers by such control that absolute neutralization of the canal as respects European powers which can in no other way be certainly attained and lastingly assured.

Another consideration forcibly suggests the necessity of modifying the convention under discussion. At the time it was agreed to, Great Britain and the United States were the only nations prominent in the commerce of Central and South America. Since that time other leading nations have greatly enlarged their commercial connections with that country, and are to-day contending for supremacy in the trade of those shores. Within the past four years, indeed, the number of French

and German vessels landing on the two coasts of Central America far exceeds the number of British vessels.

While, therefore, Great Britain and the United States may agree to do nothing, and, according to the present convention, each remains bound to the other in common helplessness, a third power, or a fourth, or a combination of many, may step in and give direction to the project which the Clayton-Bulwer treaty assumed was under the sole control of the two English-speaking nations. Indeed, so far as the canal scheme now projected at Panama finds a national sponsor or patron, it is in the Republic of France, and the non-intervention enjoined upon this country by the Clayton-Bulwer treaty, if applied to that canal, would paralyze the arm of the United States in any attempt to assert the plain rights and privileges which this government acquired through a solemn treaty with the Republic of Colombia anterior to the Clayton-Bulwer convention, so that the modification of the treaty of 1850, now sought, is not only to free the United States from unequal and inequitable obligations to Great Britain, but also to empower this government to treat with all other nations seeking a foothold on the Isthmus on the same basis of impartial justice and independence.

One of the motives that originally induced this government to assent to the Clayton-Bulwer treaty, not distinctly expressed in the instrument, but inferable from every line of it, was the expected aid of British capital in the construction of the Nicaraguan canal. That expectation has not been realized, and the changed condition of this country since 1850 has diminished, if it has not entirely removed from consideration, any advantage to be derived from that source. Whenever, in the judgment of the United States Government, the time shall be auspicious and the conditions favorable for the construction of the Nicaraguan canal, no aid will be needed outside of the resources of our own government and people; and while foreign capital will always be welcomed and never repelled, it cannot henceforth enter as an essential factor in the determination of this problem.

It is earnestly hoped by the President that the considerations now presented will have due weight and influence with Her Majesty's Government, and that the modifications of the treaty desired by the United States will be conceded in the same friendly spirit in which they are asked. The following is a summary of the changes necessary to meet the views of this government:

First. Every part of the treaty which forbids the United States fortifying the canal and holding the political control of it in conjunction with the country in which it is located to be canceled.

Second. Every part of the treaty in which Great Britain and the United States agree to make no acquisition of territory in Central America, to remain in full force. As an original proposition, this government would not admit that Great Britain and the United States should be put on the same basis, even negatively, with respect to territorial acquisitions on the American continent, and would be unwilling to establish such a precedent without full explanation. But the treaty contains that provision with respect to Central America, and if the United States should seek its annulment, it might give rise to erroneous and mischievous apprehensions among a people with whom this government desires to be on the most friendly terms. The United States has taken special occasion to assure the Spanish-American republics to the south of us that we do not intend and do not desire to cross their borders or in any way disturb their territorial integrity, and we shall not willingly incur the risk of a misunderstanding by annulling the

clauses in the Clayton-Bulwer treaty which forbid such a step with Central America. The acquisition of military and naval stations necessary for the protection of the canal and voluntarily ceded to the United States by the Central American States, not to be regarded as a violation of the provisions contained in the foregoing.

Third. The United States will not object to maintaining the clause looking to the establishment of a free port at each end of whatever canal may be constructed, if England desires it to be retained.

Fourth. The clause in which the two governments agreed to make treaty stipulations for a joint protectorate of whatever railway or canal might be constructed at Tehuantepec or Panama has never been perfected. No treaty stipulations for the proposed end have been suggested by either party, although citizens of the United States long since constructed a railway at Panama, and are now engaged in the same work at Tehuantepec. It is a fair presumption, in the judgment of the President, that this provision should be regarded as absolute by the non-action and common consent of the two governments.

Fifth. The clause defining the distance from either end of the canal where in time of war captures might be made by either belligerent on the high seas was left incomplete, and the distance was never determined. In the judgment of the President, speaking in the interest of peaceful commerce, this distance should be made as liberal as possible, and might, with advantage, as a question relating to the high seas and common to all nations, be a matter of stipulation between the great powers of the world.

In assuming as a necessity the political control of whatever canal or canals may be constructed across the Isthmus, the United States will act in entire harmony with the governments within whose territory the canals shall be located. Between the United States and the other American republics there can be no hostility, no jealousy, no rivalry, no distrust. This government entertains no design in connection with this project for its own advantage which is not also for the equal or greater advantage of the country to be directly and immediately affected. Nor does the United States seek any exclusive or narrow commercial advantage. It frankly agrees and will by public proclamation declare at the proper time, in conjunction with the republic on whose soil the canal may be located, that the same rights and privileges, the same tolls and obligations for the use of the canal, shall apply with absolute impartiality to the merchant marine of every nation on the globe. And equally in time of peace, the harmless use of the canal shall be freely granted to the war vessels of other nations. In time of war, aside from the defensive use to be made of it by the country in which it is constructed and by the United States, the canal shall be impartially closed against the war vessels of all belligerents.

It is the desire and determination of the United States that the canal shall be used only for the development and increase of peaceful commerce among all the nations, and shall not be considered a strategic point in warfare which may tempt the aggression of belligerents or be seized under the compulsions of military necessity by any of the great powers that may have contests in which the United States has no stake and will take no part.

If it be asked why the United States objects to the assent of European governments to the terms of neutrality for the operation of the canal, my answer is that the right to assent implies the right to dissent, and thus the whole question would be thrown open for contention as an international issue. It is the fixed purpose of the United States to con-

fine it strictly and solely as an American question, to be dealt with and decided by the American Government.

In presenting the views contained herein to Lord Granville, you will take occasion to say that the Government of the United States seeks this particular time for the discussion as most opportune and auspicious. At no period since the peace of 1783 have relations between the British and American Governments been so cordial and friendly as now. And I am sure Her Majesty's Government will find in the views now suggested and the propositions now submitted additional evidence of the desire of this government to remove all possible grounds of controversy between two nations which have so many interests in common and so many reasons for honorable and lasting peace.

You will, at the earliest opportunity, acquaint Lord Granville with the purpose of the United States touching the Clayton-Bulwer treaty, and in your own way you will impress him fully with the views of your government.

I refrain from directing that a copy of this instruction be left with his lordship, because in reviewing the case I have necessarily been compelled, in drawing illustrations from British policy, to indulge somewhat freely in the *argumentum ad hominem*.

This course of reasoning in an instruction to our own minister is altogether legitimate and pertinent, and yet might seem discourteous if addressed directly to the British Government. You may deem it expedient to make this explanation to Lord Granville, and if, afterwards, he shall desire a copy of this instruction, you will of course furnish it.

I am, &c.,

JAMES G. BLAINE.

71.—*Mr. Blaine to Mr. Lowell.*

No. 281.] DEPARTMENT OF STATE,
Washington, November 29, 1881.

SIR: One week after mailing my instruction to you, on the 19th instant, touching the presentation to Her Majesty's Government of a proposal for the modification of the convention between the two countries of April 19, 1850, better known as the Clayton-Bulwer treaty, I received Mr. Hoppin's No. 218, of the 11th instant, communicating the response of Lord Granville to my circular note of the 24th of June last, in relation to the neutrality of any canal across the Isthmus of Panama. I regret that Mr. Hoppin should not have advised me by telegraph of the purport of his lordship's reply, as it would have enabled me to present the arguments of my dispatch of the 19th instant in a more specific form, as meeting a positive issue, rather than as generally dealing with a subject which, for thirty years, has been regarded in but one light by the public opinion of the United States. It seems proper now, however, in reply to his lordship's note of November 10, to give a summary of the historical objections to the Clayton-Bulwer treaty, and the very decided differences of opinion between the two governments to which its interpretation has given rise.

I need hardly point out to you the well-known circumstance that, even at the time of the conclusion of the Clayton-Bulwer treaty, a very considerable opposition was shown thereto on the part of the far-sighted men in public life who correctly estimated the complications which the uncertain terms of that compact might occasion. It was ably contended in Congress that its provisions did not, even then, suffice to meet the

real points at issue with respect to the guarantee of the neutrality of the whole American isthmus on bases comporting with the national interests of the United States, and the differences of interpretation became soon after so marked as to warrant the extreme proposal of Her Majesty's Government to refer them to the arbitration of a friendly power.

The justice of those doubts became still more evident six years later, when the pretensions put forth by Her Majesty's Government toward territorial protection, if not absolute control, of portions of Nicaragua and of the outlying Bay Islands brought up the precise question of how far the provisions of the Clayton-Bulwer compact operated to restrain the projected movement, and thereupon the interpretations respectively put upon that instrument by the United States and Great Britain were perceived to be in open conflict. The attempt made in the Clarendon-Dallas treaty, which was negotiated on the 17th of October, 1856, to reconcile these opposing contentions and to place the absolute and independent sovereignty of Nicaragua over its teritory on an unmistakable footing, so far as the United States and Great Britain were concerned, failed to be completed by reason of the rejection by Her Majesty's Government of an amendment introduced by the Senate into the Clarendon-Dallas project. From that time onward the inability of the two governments to agree upon a common interpretation of the letter and spirit of the Clayton-Bulwer treaty may be accepted as a historical fact.

In the discussions between the two governments which attended the failure of the Clarendon-Dallas treaty the attitude of the United States with respect to the Clayton-Bulwer treaty was amply defined. As early as the 12th of March, 1857, I find that General Cass, then Secretary of State, in the course of a conference with Lord Napier, Her Majesty's representative,

> Passed some reflections on the Clayton-Bulwer treaty; he had voted for it, and in doing so he believed that it abrogated all intervention on the part of England in the Central American territory. The British Government had put a different construction on the treaty, and he regretted the vote he had given in its favor. (Dispatch of Lord Napier to the Earl of Clarendon, March 12, 1857.)

On the 6th of May, 1857, President Buchanan, in an audience given to Lord Napier, and in response to his lordship's suggestion that if the attempted adjustment of the difference between the governments as to the Clarendon-Dallas treaty should fail, the Clayton-Bulwer treaty remained to fall back upon, characterized that instrument in much stronger terms than General Cass had done. To quote Lord Napier's words:

> The President denounced the Clayton-Bulwer treaty as one which has been fraught with misunderstanding and mischief from the beginning. It was concluded under the most opposite constructions by the contracting parties. If the Senate had imagined that it could obtain the interpretation placed upon it by Great Britain it would not have passed. If he had been in the Senate at the time that treaty never would have been sanctioned. (Dispatch of Lord Napier to the Earl of Clarendon, May 6, 1857.)

These views are more explicitly and formally repeated in a note addressed by Secretary Cass to Lord Napier on the 29th of May, 1857. He says:

> The Clayton-Bulwer treaty, concluded in the hope that it would put an end to the differences which had arisen between the United States and Great Britain concerning Central American affairs, had been rendered inoperative in some of its most essential provisions by the different constructions which had been reciprocally given to it by the parties. And little is hazarded in saying that, had the interpretation since put upon the treaty by the British Government, and yet maintained, been anticipated, it would not have been negotiated under the instructions of any Executive of the United States nor ratified by the branch of the government intrusted with the power of ratification.

The publicity of these statements, and the strong feeling which then prevailed in all quarters that the Clayton-Bulwer convention was inadequate to reconcile the opposite views of Great Britain and the United States towards Central America, led to a very decided conviction that the treaty should be abrogated. Lord Napier reflected this growing impression when, on the 22d of June, 1857, he wrote to Lord Clarendon that—

> It is probable that if the pending discussions regarding Central America be not closed during the present summer, an attempt will be made in the next session of Congress to set aside the Clayton-Bulwer treaty. * * * There can be no doubt of the views of the President and Cabinet on this matter.

Before this tendency could, however, find its expression in any official act, a movement on the part of Her Majesty's Government placed the whole matter in a new aspect. Sir William Gore Ouseley was sent out, October 30, 1857, as a special minister, with the double purpose of concluding with the Central American states, and especially with Guatemala and Honduras, settlements of the questions relative to the Bay Islands, the Mosquito territory, and the boundaries of British Honduras, and also of visiting Washington on the way, and conferring with the Secretary of State of the United States for the purpose of ascertaining the views of his government, and establishing "a perfect understanding with the United States upon the points respecting which differences have hitherto existed between the two countries."

Among these differences was now superadded to the territorial question of Mosquito and the islands, the very question which to-day most concerns us, the question of interoceanic communication, which had for some time been the occasion of correspondence between General Cass and Lord Napier, and in relation to which General Cass wrote, on the 20th of October, 1857, as follows:

> I have thus endeavored to meet the frank suggestions of your lordship by restating with corresponding frankness the general policy of the United States with respect to the governments and the interoceanic transits of Central America. But since your lordship has referred to the Clayton-Bulwer treaty of 1850, as contemplating a harmonious course of action and counsel between the contracting parties in the settlement of Central American interests, you will pardon me for reminding your lordship that the differences which this treaty was intended to adjust between the United States and Great Britain still remain unsettled, while the treaty itself has become the subject of new and embarrassing complications.

Prior to the arrival of Sir William Ouseley in the United States Lord Napier held an important interview with President Buchanan on the 19th of October, 1857, with the object of obtaining "further elucidation of the opinions of the President with reference to the adjustment of the Clayton-Bulwer treaty." On that occasion Lord Napier declared that he believed it the intention of Her Majesty's Government, in Sir William Ouseley's mission, "to carry the Clayton-Bulwer treaty into execution according to the general tenor of the interpretation put upon it by the United States; but to do so by separate negotiation with the Central American republics, in lieu of a direct engagement with the Federal Government," and asked that, pending the negotiation intrusted to Sir William Ouseley, "no proposal to annul the [Clayton-Bulwer] treaty would be sanctioned or encouraged" by the President or the members of the United States Government. To this the President cheerfully consented, and promised to modify the statements in his annual message to Congress accordingly, and under no circumstances to countenance any attempt against the Clayton-Bulwer treaty in Congress.

Matters being in this state, with Sir William Ouseley's mission announced, and the benevolently expectant attitude of the United States

toward it assured, Lord Napier, on the 27th of October, 1857, in conference with General Cass, brought up contingently, as a discarded alternative of his government, a former proposal to refer the disputed questions to arbitration.

> The general remarked in reply [says Lord Napier, writing to the Earl of Clarendon] that he did not repudiate the principle of arbitration on all occasions; he had invoked it, and would do so again where it seemed justly applicable; but that in this matter it was declined by the American Government for the following reasons: The language of the treaty was so clear that in his opinion there ought not to be two opinions about it. * * * Then it was a mere question of the interpretation of the English language, and he held that a foreign government was not so competent to decide in such a question as the United States and England, who possessed that language in common.

The Earl of Clarendon, in reply, approved of Lord Napier's course in broaching anew the suggestion of arbitration, and authorized him to renew formally in writing the offer to refer the disputed questions arising out of the interpretation of the Clayton-Bulwer treaty to the decision of any European power (instruction of November 13, 1857), and this was accordingly done by Lord Napier in a note to General Cass dated November 30, 1857.

In his annual message to Congress in December, 1857, President Buchanan, after narrating the negotiation and failure of the Clarendon-Dallas treaty, said:

> The fact is, that when two nations like Great Britain and the United States, mutually desirous as they are, and I trust ever may be, of maintaining the most friendly relations with each other, have unfortunately concluded a treaty which they understand in senses directly opposite, the wisest course is to abrogate such a treaty by mutual consent and to commence anew. * * * Whilst entertaining these sentiments, I shall nevertheless not refuse to contribute to any reasonable adjustment of the Central American questions which is not practically inconsistent with the American interpretation of the treaty. Overtures for this purpose have been recently made by the British Government in a friendly spirit, which I cordially reciprocate.

Meanwhile the Earl of Clarendon had instructed Sir William Ouseley, under date of November 19, 1857, "not to commit Her Majesty's Government to any course whatever in respect to the Bay Islands till the intentions of the Congress of the United States in regard to the treaty of 1850 are clearly ascertained."

The situation, then, at the close of 1857 presented a triple dead-lock.

The United States had agreed not to move toward the abrogation of the treaty until it could be seen what interpretation of its provisions would result from Sir William Ouseley's mission. Sir William had received positive instructions not to move until the United States should decide whether to abrogate the treaty or not, and Lord Napier was forbidden to move until the United States should make formal answer to the proposal for arbitration. The instructions of Lord Clarendon to Lord Napier, January 22, 1858, contained these words:

> We are decidedly of opinion that it would neither be consistent with our dignity or our interest to make any proposal to the United States Government until we have received a formal answer to our formal offer of arbitration. In event of the offer being refused, it will be a great and hardly justifiable proof of the spirit of conciliation by which we are animated if we then show ourselves disposed to abrogate the Clayton-Bulwer treaty; but we must not be in too great haste.

In order, apparently, to break this dead-lock, Lord Napier wrote to General Cass, February 17, 1858, that—

> Something in the nature of an alternative was thus offered to the American Cabinet. Should the expedient of arbitration be adopted a great portion of Sir William Ouseley's duty would be transferred to other agencies. Should arbitration be declined, It was hoped that the efforts of Her Majesty's envoy would result in a settlement agreeable to the United States, inasmuch as in essential points it would carry the treaty of 1850 into operation in a manner practically conformable to the American interpretation of that instrument.

On the 10th of March, 1858, the Earl of Malmesbury, who had succeeded Lord Clarendon in the foreign office, instructed Lord Napier that until an answer was returned to the proposal for arbitration "no further steps can be taken by Her Majesty's Government with that of the United States in regard to that matter;" and, further, that—

> When this point is cleared up, Her Majesty's Government, supposing that the Government of the United States decline arbitration, will have to determine whether they should originate a proposal for the abrogation of the Clayton-Bulwer treaty or adopt any other course which the circumstances at the moment may seem to recommend.

It appears, however, that the proposal to abrogate the treaty which Lord Malmesbury reserved the right to originate had already been communicated to the Government of the United States by Lord Napier, under instructions from Lord Clarendon. In a dispatch dated March 22, 1858, Lord Napier wrote:

> The Earl of Clarendon authorized me to inform General Cass that Her Majesty's Government would not decline the consideration of a proposal for the abrogation of the treaty by mutual concert. * * * I have, accordingly, on two occasions, informed General Cass that if the Government of the United States be still of the same mind, and continue to desire the abrogation of the treaty of 1850, it would be agreeable to Her Majesty's Government that they should insert a proposal to that effect in their reply to my note respecting arbitration.

Lord Napier further reports in detail the conversations had with General Cass as to the most proper method of effecting such abrogation, if agreed to.

In reply to this dispatch of Lord Napier, the Earl of Malmesbury instructed him, April 8, 1858, that his action was approved, and that he should confine himself to pressing for an answer to his proposal for arbitration. His lordship added these significant words:

> Her Majesty's Government, if the initiative is still left to them by the unwillingness of the United States themselves to propose abrogation, desire to retain full liberty as to the manner and form in which any such proposal shall be laid on their behalf before the Cabinet at Washington. * * * The Clayton-Bulwer treaty has been a source of unceasing embarrassment to this country, and Her Majesty's Government, if they should be so fortunate as to extricate themselves from the difficulties which have resulted from it, will not involve themselves, directly or indirectly, in any similar difficulties for the future.

The answer of General Cass to Lord Napier's several proposals was, briefly, to the effect that pending the results expected from Sir William Ouseley's mission to the Central American States the United States could not adopt the alternative of arbitration, "even if it had not been twice rejected before," and, that if—

> The President does not hasten to consider now the alternative of repealing the treaty of 1850, it is because he does not wish prematurely to anticipate the failure of Sir William Ouseley's mission, and is disposed to give a new proof to Her Majesty's Government of his sincere desire to preserve the amicable relations which now happily subsist between the two countries. (General Cass to Lord Napier, April 6, 1858.)

In this posture of affairs the Earl of Malmesbury instructed Sir William Ouseley to open direct negotiations with the Central American States, and on the 18th of August instructed Lord Napier to inform the Government of the United States of the intentions and object of her Majesty's Government in the premises. His lordship added:

> Modification, arbitration, and abrogation of the Clayton-Bulwer treaty have been *flatly rejected* [the italics are my own]. Great Britain and Nicaragua are now about to treat as independent States.

I have emphasized the phrase "flatly rejected" in view of a subse-

quent instruction of the Earl of Malmesbury to Lord Napier on the 8th of December, 1858, wherein he said:

> I think you would have done better if you had not too pointedly brought before the United States Government the notion that the British Government might view with favor a proposal to abrogate the Clayton-Bulwer treaty.

It is not difficult, in following this narrative, to discern that General Cass, though not desiring to express it, had an additional motive for declining at that particular time to propose the abrogation of the Clayton-Bulwer treaty. He did not desire by such proposed abrogation to indicate his willingness that Sir William Gore Ouseley should make treaties with the separate states of Central America, unrestrained by the clauses of the Clayton-Bulwer treaty inhibiting the extension of British power in that region. General Cass, with his accustomed caution and wisdom, clearly perceived that for the United States to propose abrogation on the very eve of Sir William Ouseley's mission would lead to injurious inferences, and would imply conclusions which the United States was not prepared to admit.

Objectionable as General Cass thought the Clayton-Bulwer treaty, he thought it was better than giving the implied consent of this government that Great Britain should obtain such treaties as the force of her power might secure in Central America.

The subsequent note of Lord Malmesbury, not strained by an uncharitable construction, throws additional light on the subject, and confirms the wisdom of General Cass in declining to propose abrogation at that time. And, besides, General Cass evidently desired to retain those very clauses of the Clayton-Bulwer treaty to which, in my dispatch of the 19th, I proposed on the part of this government to adhere.

I have dwelt with somewhat of detail on this particular historic episode, partly because it admirably illustrates the spirit with which both governments have regarded the Clayton-Bulwer treaty from the first, and partly because it had more direct bearing on the question of the guarantee of any isthmian transit than any other discussion of the time. In perusing the voluminous correspondence, unprinted as well as that printed and submitted at the time to Congress and to Parliament, I am more than ever struck by the elastic character of the Clayton-Bulwer treaty, and the admirable purpose it has served as an ultimate recourse on the part of either government to check apprehended designs in Central America on the part of the other; although all the while it was frankly admitted on both sides that the engagements of the treaty were misunderstandingly entered into, imperfectly comprehended, contradictorily interpreted, and mutually vexatious.

I am, as I must confess, strengthened in this impression by the circumstance that, in his response to my dispatch of the 24th of June last, Earl Granville takes the ground that the position of Great Britain and the United States toward the projected Panama Canal is determined by the Clayton-Bulwer treaty. It does not seem likely to become a subject for discussion how far the engagements of that compact in reality extend to the Isthmus of Panama under the provisions of Article VIII thereof in the same precise sense in which they extend to the projected Nicaraguan transit.

For it will be observed that this article does not stretch the guarantees and restrictions of Article I over either the Tehuantepec route through Mexican territory or the Panama route through Colombian territory. It is in terms an agreement to extend the protection of both countries, by treaty stipulations, to those or any other practicable water-

ways or railways, from ocean to ocean, across the Isthmus, outside of Nicaragua, Costa Rica, the Mosquito coast, or any part of Central America. So far as this inchoate agreement to hereafter agree is applicable to the Panama transit, I have amply shown, in my No. 270 of the 19th instant, that the obligations embraced on the part of the United States in concluding the prior convention with the Republic of New Granada (now Colombia) in 1846 require that the United States should be freed from unequal and inequitable obligations to Great Britain under the vague and, as yet, unperfected compact of 1850.

My main object in writing this instruction has been to strengthen your hands in any discussion which may now ensue as to the benefits of the Clayton-Bulwer treaty and the mutual interest of the two countries in conserving it as the basis of a settlement of all disputes between them touching Central American and isthmian questions. It will be seen that, from the time of its conclusion in 1850 until the end of 1858, its provisions were thrice made the basis of a proposal to arbitrate as to their meaning, that modification and abrogation have been alike contingently considered, and that its vexatious and imperfect character has been repeatedly recognized on both sides. The present proposal of this government is to free it from those embarrassing features, and leave it, as its framers intended it should be, a full and perfect settlement, for all time, of all possible issues between the United States and Great Britain with regard to Central America.

If in your conferences with Earl Granville it should seem necessary, you will make free use of the precedents I have cited, and should you, within the discretionary limits confided at the end of my No. 270, have given a copy thereof to his lordship, you are equally at liberty to let him have a copy of this also, with the same explanation, that it is for your use, and not written as a formal note for communication to Her Majesty's Government.

I am, &c.,

JAMES G. BLAINE.

72.—*Mr. Lowell to Mr. Blaine.*

No. 266.] LEGATION OF THE UNITED STATES,
London, December 15, 1881. (Received December 29.)

SIR: I have the honor to acquaint you that on the 13th instant I had an interview with Lord Granville at the foreign office, and communicated to him the substance of your instruction No. 270, of the 19th ultimo. I then, at his request, read it to him, beginning, however, with the concluding paragraph, for obvious reasons. At his desire I left a copy with him.

I thought it wiser, in a matter of so much moment, that he should receive the views of the President as they were conveyed in the dispatch, rather than, perhaps, to weaken their force by communicating them in my own manner, as I was authorized by you to do.

Lord Granville listened with great attention, and merely said that he should reserve his answer.

I have, &c.,

J. R. LOWELL.

73.—*Mr. Lowell to Mr. Blaine.*

No. 277.] LEGATION OF THE UNITED STATES,
London, December 27, 1881. (Received January 9, 1882.)

SIR: I have the honor to report that so soon as I received your instruction No. 281, the 29th ultimo, I addressed a private note to Lord Granville informing him of the fact, and asking him when it would be convenient for him to favor me with an interview. In his reply he asked me if I could come to him at Walmer, where he was detained by the hospitalities of the Christmas season. Thinking it important that he should see the dispatch as soon as possible, because it was so nearly related to your No. 270, I accordingly went down to Walmer on the 23d instant. I there read the dispatch to him, and at his desire left a copy of it with him. I did not think it prudent or proper to enter upon any discussion with Lord Granville upon the general topics of the dispatch, but as some of the newspapers here had criticised it as untimely, I thought it not out of place to remind him that the policy of the United States had already been clearly indicated in a message to Congress by President Hayes, and more strongly reiterated in the same public manner by President Garfield.

Lord Granville was, as usual, exceedingly courteous and friendly, but made no remark except that the publication of No. 270, before an opportunity was given him of replying to it, "seemed to him, to say the least, unusual."

I have, &c.,

J. R. LOWELL.

74.—*Lord Granville to Mr. West.*

FOREIGN OFFICE, *January* 7, 1882.

SIR: In my dispatch No. 279*a* of the 13th ultimo I informed you that the United States minister at this court had communicated to me the substance of a dispatch which he had received from Mr. Blaine, then Secretary of State, on the subject of the convention of the 19th April, 1850. Finding that Mr. Lowell was authorized to give me a copy of this dispatch if I wished it, I requested him to do so, and I have already forwarded to you a copy for your information.

Her Majesty's Government have given their careful consideration to the views set forth in this paper. They entirely agree in the statement made towards its conclusion as to the cordial relations so happily existing between the two countries, and as to the opportunity which this state of things affords for a frank exposition of the views held by either government without risk of misconstruction. They have no hesitation, therefore, in proceeding to examine the grounds advanced by Mr. Blaine for desiring a modification of the convention.

The principles upon which the whole argument of the dispatch is founded are, as far as I am aware, novel in international law. If a discussion of the subject on the abstract grounds of public right were deemed useful or opportune, it would not be difficult to quote passages from publicists of acknowledged authority in both countries in support of this opinion. But for several reasons it will be better to treat the matter from the side of the practical consideration which it involves,

without, of course, being precluded from reverting at any future stage, in case of need, to its other aspect.

Her Majesty's Government cannot admit that the analogy which it is sought to draw from the conduct of Great Britain in regard to the Suez Canal is correct or justified by the facts. They have made no attempt to fortify the island of Cyprus, or to establish it as an armed position on an important scale, though they have an undoubted right to do so. The fortress of Gibraltar, the island of Malta, and the military establishment at Aden came into the possession of England at a date long anterior to the time when the Mediterranean and the Red Sea could be regarded as a military route to India. For years afterwards the whole mass of reenforcements for India was sent by the way of Cape of good Hope. Nor has any serious addition been made to the strength of these positions since the opening of the canal beyond what has been a natural consequence of the improvements in military science. Although no doubt well adapted by its situation to command the Straits of Bab-el-Mandeb, the Island of Perim has not in any real sense been made a fortified position. The fort and garrison on the island are, in fact, sufficient only to protect the light-house, which has been erected there for the general benefit of navigation, from possible attack by predatory Arabs.

The Navy Department of the United States must be well aware that Her Majesty's Government have never sought to bar or even to restrict the use of the canal by the naval forces of other countries, and that even during the recent war between Russia and Turkey, when the canal itself formed a portion of the territory of one of the belligerents, when the seat of conflict was close at hand, and when British interests might in many other respects have been nearly involved, they contented themselves with obtaining an assurance that the sphere of operations should not be extended to the canal.

Her Majesty's Government cordially concur in what is stated by Mr. Blaine as regards the unexampled development of the United States on the Pacific coast, and the capacity which they possess for further progress. That development has been watched in this country with admiration and interest, and will continue to be so regarded. But though in rapidity it may, and probably has, exceeded the most sanguine calculation, Her Majesty's Government cannot look upon it in the light of an unexpected event, or suppose that it was not within the view of the statesmen who were parties on either side to the Clayton-Bulwer treaty. The declarations of President Monroe and of his cabinet, in 1823 and 1824, whatever may be the view taken of their scope and bearing, and of the admissibility of the principles which they involve, or which it is sought to deduce from them, show at least that at that period—twenty-six years anterior to the treaty now under discussion—there was a clear prevision of the great future reserved to the Pacific coast. It is, in the opinion of Her Majesty's Government, an inadmissible contention that the regular and successful operation of causes so evident at the time, and in their nature so irrepressible, should be held to have completely altered the condition of affairs to the extent of vitiating the foundations of an agreement which cannot be supposed to have been concluded without careful thought and deliberation.

While recognizing to the fullest degree the extent to which the United States must feel interested in any canal which may be constructed across the Isthmus of Panama, Her Majesty's Government would be wanting in regard to their duty if they failed to point out that Great Britain has large colonial possessions, no less than great commercial interests, which render any means of unobstructed and rapid access from the Atlantic to

the North and South Pacific Oceans a matter for her also of the greatest importance.

The development of these possessions and interests has steadily continued, possibly with less rapidity, but on a scale which has some relation even to that of the Pacific States. Her Majesty's Government do not wish to ignore the share which other nations have acquired in the commerce of Central and South America, nor to exclude from consideration the interest of those countries in any canal which may be made across the Isthmus. They are of opinion that such a canal as the water-way between two great oceans and between all Europe and Eastern Asia is a work which concerns not merely the United States or the American Continent, but the whole civilized world. This is a view which finds its expression in the VIth article of the treaty of 1850. Her Majesty's Government are as anxious as that of the United States that, while all nations should enjoy their proper share in the benefits to be expected from the undertaking, no single country should acquire a predominating influence or control over such a means of communication; and they will not oppose or decline any discussion for the purpose of securing on a general international basis its universal and unrestricted use.

With all deference to the considerations which have prompted the proposals made in Mr. Blaine's dispatch, Her Majesty's Government cannot believe that they would promote this object or be beneficial in themselves. The relations of the United States with the European powers are fortunately of a nature to give rise to no feelings of suspicion or alarm. The general tendency of their foreign policy gives good promise that they will so continue. But if provision is to be made on one side for a different state of affairs, it must be expected that the course thus indicated will find its natural and logical counterpart on the other. Her Majesty's Government can conceive no more melancholy spectacle than a competition among the nations holding West Indian possessions, and others on the Central and South American Continent, in the construction of fortifications to obtain the command over the canal and its approaches, in the event of occasion arising for such a measure. They cannot believe that it would be agreeable or convenient to any South American state through which the canal may pass to find itself called upon to admit a foreign power to construct and garrison on its territory a succession of fortresses of increasing magnitude, designed to oppose such attempts, even though that foreign power be a neighboring one and situated upon the same continent. And when the claim to do this is accompanied by a declaration that the United States will always insist on treating the water-way which shall unite the two oceans "as part of her coast line," it is difficult to imagine that the states to which the territory lying between that water-way and the United States belongs can practically retain as independent a position as that which they now enjoy.

These are the consequences which, in the conviction of Her Majesty's Government, would almost certainly follow from a claim on the part of the United States to assume the supreme authority over the canal and all responsibility for its control. Her Majesty's Government hold, on the contrary, that the principles which guided the negotiators of the convention of 1850 were intrinsically sound, and continue to be applicable to the present state of affairs. Their wish would be that those principles should receive the practical development which was contemplated at the time; and that effect should be given to that portion of the treaty which provides that the contracting parties shall invite all other states with whom they have friendly intercourse to enter into similar stipulations with them.

A certain amount of progress was made in this direction by the conclusion of conventions with Honduras and Nicaragua by Great Britain in 1856 and 1860, and by the United States in 1864 and 1867, and by Nicaragua with France in 1859, with the object of upholding the general principles inserted in the treaty. During the period when there were still matters to regulate with respect to Grey Town, the Bay Islands, the frontier of British Honduras, and the protection of the Mosquito Indians, and when the construction of a canal still seemed a contingency more or less doubtful and remote, it was not strange that the engagement to address other powers should have been allowed to remain dormant; but the project of the canal has now assumed sufficient shape to render such an application reasonable and pertinent.

Her Majesty's Government believe that the extension of an invitation to all maritime states to participate in an agreement based on the stipulations of the convention of 1850 would obviate any objection that may possibly be raised against it as not being adequate in its present condition for the purpose for which it was designed. This course formed the basis of Mr. Fish's proposal to Dr. Cardenas, the Nicaraguan minister, in 1877; and Her Majesty's Government would gladly see the United States again take the initiative in an invitation to the powers, and will be prepared either to join it or to support and indorse it in the way that may be found most fitting and convenient, provided it does not conflict in any way with the Clayton-Bulwer treaty.

You are authorized to read this dispatch to the Secretary of State, and to give him a copy of it if he should desire it.

I am, &c.,

GRANVILLE.

The Hon. LIONEL S. S. WEST.

75.—*Lord Granville to Mr. West.*

No. 8. FOREIGN OFFICE, *January* 14, 1882.

SIR: In my dispatch 296 of the 31st ultimo I have forwarded to you a copy of a dispatch from Mr. Blaine to the United States minister at this court, containing further observations in support of his arguments and proposal for a modification of the treaty between this country and the United States of the 19th of April, 1850. In this dispatch Mr. Blaine gives extracts from the correspondence which passed between the two governments between 1856 and 1858, in consequence of questions that arose as to the construction to be placed on certain provisions of the treaty. Mr. Blaine seeks to establish from these extracts that "the vexatious and imperfect character of the treaty has been repeatedly recognized on both sides;" and he adds that the present proposal of the United States Government "is to free it from those embarrassing features, and to leave it, as its framers intended it should be, a full and perfect settlement, for all time, of all possible issues between the United States and Great Britain with regard to Central America."

The correspondence in question was laid before Parliament in 1860, and the principal papers included in it have also been published in Hertslet's State Papers.* A reference to the context of the passages quoted by Mr. Blaine will be necessary in order to appreciate the character which Mr. Blaine has attributed to them.

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* Vol. xl, p. 953; xli, p. 757; xlii, p. 153; xlvi, p. 244; xlvii, p. 661; xlviii, p. 630; L, p. 126.

In cases where the details of an international agreement have given rise to difficulties and discussions to such an extent as to cause the contracting parties, at one time, to contemplate its abrogation or modification as one of several possible alternatives, and where it has yet been found preferable to arrive at a solution as to those details rather than to sacrifice the general basis of the engagement, it must surely be allowed that such a fact, far from being an argument against that engagement, is an argument distinctly in its favor. It is equally plain that either of the contracting parties which had abandoned its own contention for the purpose of preserving the agreement in its entirety would have reason to complain if the differences which had been settled by its concession were afterwards urged as a reason for essentially modifying those other provisions which it had made this sacrifice to maintain. That both these arguments apply in the present instance a brief review of the correspondence will, I think, suffice to show.

The treaty of 1850 was concluded (as is declared in the VIIIth Article) with the desire "not only to accomplish a particular object, but also to establish a general principle" in regard to the protection, by treaty stipulations, of any practical communications, whether by canal or railway, across the isthmus which connects North and South America.

The preamble and first article of the treaty run as follows:

> Her Britannic Majesty and the United States of America, being desirous of consolidating the relations of amity which so happily subsist between them, by setting forth and fixing in a convention their views and intentions with reference to any means of communication by ship-canal, which may be constructed between the Atlantic and Pacific Oceans, by the way of the river St. Juan de Nicaragua, and either or both of the lakes of Nicaragua or Managua, to any port or place on the Pacific Ocean; * * *
>
> ART. I. The Governments of Great Britain and the United States hereby declare that neither the one nor the other will ever obtain or maintain for itself any exclusive control over the said ship-canal; agreeing that neither will ever erect or maintain any fortifications commanding the same, or in the vicinity thereof, or occupy, or fortify, or colonize, or assume or exercise any dominion over Nicaragua, Costa Rica, the Mosqu to coast, or any part of Central America; nor will either make use of any protection which either affords, or may afford, or any alliance which either has, or may have, to or with any state or people, for the purpose of erecting or maintaining any such fortifications, or of occupying, fortifying, or colonizing Nicaragua, Costa Rica, the Mosquito coast, or any part of Central America, or of assuming or exercising dominion over the same. Nor will Great Britain or the United States take advantage of any intimacy, or use any alliance, connection, or influence that either may possess with any state or government through whose territory the said canal may pass, for the purpose of acquiring or holding, directly or indirectly, for the subjects or citizens of the one, any rights or advantages in regard to commerce or navigation through the said canal which shall not be offered, on the same terms, to the subjects or citizens of the other.

Soon after the signature of the treaty various discussions arose as to the interpretation to be put upon those clauses which debarred either of the contracting parties from occupying, fortifying, or colonizing, or assuming or exercising any dominion over Nicaragua, Costa Rica, the Mosquito coast, or any part of Central America, &c. Great Britain being at the time in possession of Ruatan and other islands off the coast of Honduras, and having a protectorate over the Mosquito Indians located on the coast of Nicaragua, a lengthened correspondence arose as to the effect to be given to the treaty in this respect, and also as to the boundary of British Honduras. A treaty was eventually signed by Lord Clarendon and Mr. Dallas for the settlement of the various questions at issue on the 17th October, 1856; but this agreement was not received with favor by the United States Senate, and the incoming government of President Buchanan, who had acceded to office in March, 1857, declined to confirm it without certain modifications. To these the British Government proposed further amendments, which were not at that time

deemed acceptable by that of the United States, and the treaty was never formally ratified.

To show how far this part of the discussion belonged in some of its features to a state of affairs that is now past, one of the objections taken by General Cass to the treaty in its last amended form was that it involved a recognition by the United States of a treaty between Great Britain and Honduras for the cession of the Bay Islands to the latter country, in which it was stipulated that slavery should not at any time be permitted to exist there. General Cass stated that "a treaty with such a provision would never be recognized by a United States Senate." (Lord Napier to Lord Clarendon, May 3, 1857.)

I now proceed to examine some of the extracts given in Mr. Blaine's dispatch.

The first paper quoted is one from Lord Napier to the Earl of Clarendon, dated the 12th March, 1857.

The only passage quoted is as follows:

> General Cass then passed some reflections on the Clayton-Bulwer treaty; he had voted for it, and in doing so he believed that it abrogated all intervention on the part of England in the Central American territory. The British Government had put a different construction on the treaty, and he regretted the vote he had given in its favor.

But the dispatch goes on to say:

> He did not, however, pretend that the British Government should now unconditionally abandon the Mosquitos, with whom they had relations of an ancient date; it was just and consistent with the practice of the United States that those Indians should be secured in the separate possession of lands, the sale of which should be prohibited, and in the enjoyment of rights and franchises, though in a condition of dependency and protection. The British Government had already removed one impediment to the execution of the Bulwer-Clayton treaty by the cession of their claims on Ruatan; two difficulties now remained—the frontier of Belize, and the delimitation and settlement of the Mosquito tribe. If the frontier could be defined, and if the Mosquitos could be placed in the enjoyment of their territory by treaty between Great Britain and Nicaragua, in which the concessions and guarantees of the latter in favor of the Indians should be associated with the recognition of the sovereignty of Nicaragua—so I understood the general—*then the Bulwer-Clayton treaty might be a permanent and satisfactory settlement between the contracting parties;* the United States desiring nothing else than an absolute and entire neutrality and independence of the Central American region, free from the exercise of any exclusive influence or ascendency whatever.

The next quotation is from another dispatch of Lord Napier, dated the 6th May, 1857, and the passage given runs thus:

> The President denounced the Clayton-Bulwer treaty as one which had been fraught with misunderstanding and mischief from the beginning; it was concluded under the most opposite constructions by the contracting parties. If the Senate had imagined that it could obtain the interpretation placed upon it by Great Britain, it would not have passed. If he had been in the Senate at the time, that treaty never would have been sanctioned.

But President Buchanan went on to say:

> With reference to arbitration (which Lord Napier had only thrown in as a suggestion of his own), he could not give any opinion at present. The President also inveighed against the excess of treaties, affirming that they were more frequently the cause of quarrel than of harmony, and that if it were not for the interoceanic communications he did not see there was any necessity for a treaty respecting Central America at all.

It seems, therefore, that the President's condemnation of the Clayton-Bulwer treaty was principally founded on the construction placed upon it by Great Britain at the time, and was also in some measure explained by his objections to treaties in general, but that he admitted that the question of the interoceanic connection made such an agreement necessary.

Mr. Blaine then quotes a note from Mr. Cass to Lord Napier, of the 29th May, 1857, as follows:

The Clayton-Bulwer treaty, concluded in the hope that it would put an end to the differences which had arisen between the United States and Great Britain concerning Central American affairs, had been rendered inoperative in some of its most essential provisions by the different constructions which had been reciprocally given to it by the parties. And little is hazarded in saying that, had the interpretation since put upon the treaty by the British Government, and yet maintained, been anticipated, it would not have been negotiated under the instructions of any Executive of the United States, nor ratified by the branch of the government intrusted with the power of ratification.

But how does General Cass continue? He goes on to say:

A protracted discussion, in which the subject was exhausted, failed to reconcile the conflicting views of the parties; and, as a last resort, a negotiation was opened for the purpose of forming a supplementary treaty which should remove, if practicable, the difficulties in the way of their mutual good understanding, and leave unnecessary any further discussion of the controverted provisions of the Clayton-Bulwer treaty. It was to effect this object that the Government of the United States agreed to open the negotiation which terminated in the treaty of the 17th October, 1856, and though the provisions of that instrument, even with the amendments proposed by the Senate, were not wholly unobjectionable either to that body or to the President, still, *so important did they consider a satisfactory arrangement of this complicated subject*, that they yielded their objections, and sanctioned, by their act of ratification, the convention as amended. It was then transmitted to London for the consideration of Her Britannic Majesty's Government, and, having failed to meet its approbation, has been returned unratified. The parties are thus thrown back upon the Bulwer-Clayton treaty, with its disputed phraseology and its conflicting interpretations; and, after the lapse of seven years, not one of the objects connected with the political condition of Central America which the United States had hoped to obtain by the arrangement has been accomplished.

It was not, therefore, to the principles or basis of the arrangement (the importance of which was fully recognized), but to the unfortunate phraseology of a single portion of the treaty, that objection was taken.

Mr. Blaine then refers to Sir W. Gore Ouseley's mission, the object of which was to settle the points at issue, in a manner practically satisfactory to the United States, by independent negotiations with the Central American States, after first communicating with the government at Washington. Mr. Blaine quotes a passage from a letter of General Cass to Lord Napier of the 20th October, 1857, as follows:

I have thus endeavored to meet the frank suggestions of your lordship by restating, with corresponding frankness, the general policy of the United States with respect to the governments and the interoceanic transits of Central America; but since your lordship has referred to the Clayton-Bulwer treaty of 1850, as contemplating a "harmonious course of action and counsel between the contracting parties in the settlement of the Central American interests," you will pardon me for reminding your lordship that the differences which this treaty was intended to adjust between the United States and Great Britain still remain unsettled, while the treaty itself has become the subject of new and embarrassing complications.

It will be useful to refer to the previous portion of this note to show what was the statement of the "general policy of the United States" thus referred to, and how far that policy corresponds with Mr. Blaine's present proposals. The note begins thus:

I have the honor to receive your lordship's communication of the 9th instant, in reference to the existing relations between Nicaragua and Costa Rica, and have submitted it to the consideration of the President.

These relations have attracted the earnest attention of the President, not only from the importance of the San Juan transit to the commerce of the world, but from the interest which is naturally felt by the United States in the neighboring republics of this continent. The President has witnessed, therefore, the restoration of peace to Nicaragua and Costa Rica with the highest gratification; and he sincerely hopes that it may not again be interrupted, either by the calamity of civil war or the invasion of their territory from other countries. Their security and welfare would undoubtedly

be promoted by a just and friendly settlement between them of their mutual boundaries and jurisdiction; and I need hardly add that such an adjustment would be viewed with satisfaction by the United States. This government, however, has never admitted the pretensions of Costa Rica to an equal control with Nicaragua of the San Juan River, but has regarded the sovereignty of the river, and consequently of the interoceanic transit by that route, as rightfully belonging to the Republic of Nicaragua.

A similar view of the question appears to have been recognized by Great Britain; and, whatever may be the rights of Costa Rica with respect to the free passage of her own products by the river to the ocean, it is better, probably, that what has been thus acquiesced in, and has led, moreover, to important contracts and responsibilities, should not now be disturbed. But under any circumstances the commercial nations of the world can never permit the interoceanic passages of the isthmus to be rendered useless for all the great purposes which belong to them in consequence of the neglect or incapacity of the states through whose territories they happen to run. *The United States, as I have before had occasion to assure your lordship, demand no exclusive privileges in these passages*, but will always exert their influence to secure their free and unrestricted benefits, both in peace and war, to the commerce of the world.

And in a later note to Lord Napier, of the 8th November, 1858, General Cass states with still greater clearness the object with which the treaty was concluded, and the grounds on which the difference between the two governments had arisen. He says:

Since the announcement by your lordship, in October, 1857, of Sir William Ouseley's special mission, the President has awaited, not so much any new proposition for the adjustment of the Central American questions as the statement in detail, which he had been led to expect, of the method by which Sir William Ouseley was to carry into effect the previous proposition of the British Government. To make this plain, your lordship will pardon me for making a brief reference to what has occurred between the two governments in respect to Central America since the ratification of the Clayton-Bulwer treaty of 1850.

While the declared object of that convention had reference to the construction of a ship-canal by the way of San Juan and the Lakes of Nicaragua and Managua, from the Atlantic to the Pacific Ocean, *yet it avowed none the less plainly a general principle in reference to all practicable communications across the isthmus, and laid down a distinct policy by which the practical operation of this principle was likely to be kept free from all embarrassment. The principle was that the interoceanic routes should remain under the sovereignty of the states through which they ran, and should be neutral and free to all nations alike. The policy was that, in order to prevent any government outside of those states from obtaining undue control or influence over those interoceanic transits, no such nation should erect or maintain any fortifications commanding the same, or in the vicinity thereof, or should "occupy, or fortify, or colonize, or assume, or exercise any dominion over Nicaragua, Costa Rica, the Mosquito coast, or any part of Central America."* So far as the United States and Great Britain were concerned, those stipulations were expressed in unmistakable terms; and in reference to other nations, it was declared that the "contracting parties in this convention engage to invite every state with which both or either have friendly intercourse to enter into stipulations with them similar to those which they have entered into with each other.

At that time the United States had no possessions whatever in Central America, and exercised no dominion there. In respect to this government, therefore, the provisions of Article I of the treaty could operate only as a restriction for the future; but Great Britain was in the actual exercise of dominion over nearly the whole eastern coast of that country, and, in relation to her, this article had a present as well as a prospective operation. She was to abandon the occupancy which she already had in Central America, and was neither to make acquisitions, or erect fortifications, or exercise dominion there in the future. In other words, she was to place herself in the same position with respect to possessions and dominion in Central America which was to be occupied by the United States, and which both of the contracting parties to the treaty engaged that they would endeavor to induce other nations to occupy.

This was the treaty as it was understood and consented to by the United States, and this is the treaty as it is still understood by this government.

He then recapitulates the discussions and abortive negotiations which had ensued in consequence of the different interpretations put upon the treaty by the two governments; and, after criticising and expressing disappointment at the last communication made to him by Lord Napier, he concludes:

It is of no small consequence either to the United States or Great Britain that these Central American controversies between the two countries should be forever

closed. On some points of them, and, I have been led to hope, on the general policy which ought to apply to the whole isthmian region, they have reached a common ground of agreement. The neutrality of the interoceanic routes, and their freedom from the superior and controlling influence of any one government; the principles upon which the Mosquito protectorate may be arranged, with justice alike to the sovereignty of Nicaragua and the Indian tribes; the surrender of the Bay Islands, under certain stipulations for the benefit of trade and the protection of their British occupants; and the definition of the boundaries of British Belize; about all these points there is no apparent disagreement, except as to the conditions which shall be annexed to the Bay Islands' surrender, and as to the limits which shall be fixed to the settlements of Belize. Is it possible that, if approached in a spirit of conciliation and good feeling, these two points of difference are not susceptible of a friendly adjustment? To believe this would be to underestimate the importance of the adjustment, and the intelligent appreciation of this importance which must be entertained by both nations. What the United States want in Central America, next to the happiness of its people, is the security and neutrality of the interoceanic routes which lead through it. This is equally the desire of Great Britain, of France, and of the whole commercial world. If the principles and policy of the Clayton-Bulwer treaty are carried into effect, this object is accomplished. When, therefore, Lord Malmesbury invites new overtures from this government upon the idea that it has rejected the proposal embraced in Sir William Ouseley's mission for an adjustment of the Central American questions by separate treaties with Honduras, Nicaragua, and Guatemala, upon terms substantially according with the general tenor of the American interpretation of the treaty, I have to reply to his lordship that this very adjustment is all that the President has ever desired, and that, instead of having rejected that proposal, he had expressed his cordial acceptance of it, so far as he understood it, and had anticipated from it the most gratifying consequences.

Further, in a dispatch to Mr. Lamar of July 25, 1858, subsequently communicated to Lord Malmesbury by Mr. Dallas on the 29th April, 1859, General Cass says:

> These great avenues of intercommunication are vastly interesting to all commercial powers, and all may well join in securing their freedom and use against those dangers to which they are exposed from aggressions or outrages, originating within or without the territories through which they pass.

It is difficult to conceive a more distinct statement of adherence to the general principles of the Clayton-Bulwer arrangement, or a more positive disclaimer of the policy involved in Mr. Blaine's present proposals, than is contained in the passages I have just quoted.

I return, however, to the extracts given in Mr. Blaine's dispatch Mr. Blaine alludes to an important interview which Lord Napier had with President Buchanan on the 19th October, 1857, in which Lord Napier asked that, pending the negotiation intrusted to Sir W. Gore Ouseley, no proposal to annul the Clayton-Bulwer treaty should be sanctioned or encouraged by the President or members of the United States Government. Lord Napier's account of the President's language is as follows:

> The President commenced his observations by referring to the Clayton-Bulwer treaty as a fruitful source of misunderstanding between the contracting parties. Without that treaty the United States and Great Britain might long since have cooperated for the welfare of Central America. That treaty had never been acceptable to the people of the United States, and would not have obtained a vote in the Senate had the least suspicion existed of the sense in which it was to be construed by Great Britain; yet, if it were now the intention of Her Majesty's Government to execute it according to the American interpretation, that was as much as we could insist upon.

And after reporting what passed at the interview with regard to the Bay Islands and Honduras, Lord Napier continued:

> I then went on to animadvert upon the danger of some movement in the approaching Congress which would interfere with the contemporary negotiation of Sir William Ouseley, remarking that should the President, in his message, allude to the position of the two countries in reference to Central America, and if, in consequence of his excellency's reflections, a resolution should be proposed for the abrogation of the Clayton-Bulwer treaty, such a step would not only frustrate the purposes of Sir William Ouseley's mission, but would have a calamitous influence on the future relations of

England and America. It would, therefore, be highly gratifying to me to be enabled to assure your lordship that, pending the negotiation intrusted to Sir William Ouseley, no proposal to annul the treaty would be sanctioned or encouraged by his excellency or by the members of his government.

The President stated, in reply, that it was certainly his intention to give an account in his message of all that had passed between the two governments respecting the Dallas-Clarendon treaty. He appeared to intimate that the effect of such a narrative would be to place the conduct of Great Britain in an unfavorable light, and he added that the passage in which he commented upon these transactions was already prepared; but his excellency went on to affirm, with emphasis, that if the resolutions of Her Majesty's Government were such as I had related, if they really meant to execute the Clayton-Bulwer treaty according to the American interpretation, and would, before the meeting of Congress, make some communication to him in that sense, such as he could use, he would cancel what he had written and insert another passage referring to the mission of Sir William Ouseley, and that "nothing would give him greater pleasure than to add the expression of his sincere and ardent wish for the maintenance of friendly relations between the two countries."

His excellency also distinctly declared that, under the circumstances here described, no attempt against the Clayton-Bulwer treaty in Congress would have any countenance from him whatever. To him it was indifferent whether the concession contemplated by Her Majesty's Government were consigned to a direct engagement between England and the United States, or to treaties between the former and the Central American republics; the latter method might, in some respects, be even more agreeable to him, and he thought it would be more convenient to Her Majesty's Government, who might, with greater facility, accede to the claims of the weaker party.

I pass over some passages given in Mr. Blaine's dispatch which seem to call for no remark, and I would only observe that the proposal for arbitration alluded to in Lord Napier's note to General Cass of February 17, 1858, applied only to the controverted points in the treaty, and not to the whole instrument.

Mr. Blaine refers to a conversation with General Cass, reported by Lord Napier in a dispatch of the 22d March, 1858, in which reference was made to the idea of an abrogation of the treaty. It may be well to give a larger extract of this dispatch, because, although Lord Napier's remarks were stated to be personal and unofficial, they show his view of the form which such an abrogation should take. He says:

I have, accordingly, on two occasions, informed General Cass that if the Government of the United States be still of the same mind, and continue to desire the abrogation of the treaty of 1850, it would be agreeable to Her Majesty's Government that they should insert a proposal to that effect in their reply to my note respecting arbitration, and to that in which I explained the character and motives of the mission intrusted to Her Majesty's commissioner in Central America.

Some conversation ensued regarding the manner in which the dissolution of the treaty should be effected, and the condition by which it might be accompanied, and on these topics I have held the following language, premising that the views expressed were altogether spontaneous and personal, for I had no information of the intentions of Her Majesty's Government beyond the bare fact that they would entertain a proposal to cancel the engagements of 1850 emanating from the United States.

I stated that, in my opinion, the treaty in question could only be repealed by a new treaty in the usual forms, and that it might be desirable that such a treaty should not be restricted to a single article annulling its predecessor. Both for considerations of decency and policy I advocated the insertion of stipulations involving an expression of a common policy in Central America, and the disavowal of any exclusive or monopolizing projects on either side. I said that I thought a treaty might be framed of three articles.

The first should declare the desire of the contracting parties to encourage and protect the organization of transit routes in the interoceanic region, and bind those parties never to negotiate for any rights or privileges of transit with the Central American States of a preferential or exclusive character, to which other nations might not, by negotiation, be equally admitted, establishing thus the principle of an equal enjoyment of those avenues of trade for all the countries of the world.

The second article might recognize the jurisdiction of the transit route by the San Juan River as being vested in the government of Nicaragua. This had been already avowed by the United States in a treaty negotiated with that republic. It had not been definitely affirmed by Great Britain, and might seem to clash with the claims of the King of Mosquitia to territorial possession or authority in those parts. I thought,

however, that in regard to the views lately expressed by Her Majesty's Government in the course of recent negotiations, in consideration of the necessity of obtaining a suitable treaty with Nicaragua, and for the purpose of placing themselves in harmony with the course pursued by the United States, Her Majesty's Government might, on this head, accede to an article which would practically restrict their protectorate in Mosquitia, and prevent the importation of any interference on their part with the territory traversed by the river, and, therefore, by the transit route.

Finally, I suggested that Article III of the treaty should simply declare the provisions of the treaty of 1850 to be void and of no effect. I added that the question of future territorial acquisition in Central America would thus be thrown open to the United States; that Her Majesty's Government, on the other hand, would retain the colony of Honduras in the proportions which might be given to it by treaty arrangements with Guatemala, and that the Bay Islands would remain attached to the British Crown. Indeed, I affirmed, still as a personal opinion, but of the most positive character, that in case of the dissolution of the Clayton-Bulwer treaty, the Bay Islands would not be relinquished by Her Majesty's Government. I felt bound to make this statement, having observed in some quarters an impression that Her Majesty's Government might be disposed not only to annul the treaty, thus opening a path for the eventual annexation of the isthmus to the Federal Union, but to give up the Bay Islands as well; a notion altogether unfounded in any intimation which has hitherto reached me from the Foreign Office, and which could not be reconciled, in my opinion, to the interests of England.

Lord Napier adds that he was most careful to remark throughout that the opinions he enunciated with reference to the treaty were exclusively his own.

Mr. Blaine gives only a very short extract from Lord Malmesbury's dispatch in reply of the 8th April, 1858. It will be desirable to quote it more at length. Lord Malmesbury says:

Her Majesty's Government, if the initiative is still left to them by the unwillingness of the United States themselves to propose abrogation, desire to retain full liberty as to the manner and form in which any such proposal shall be laid on their behalf before the Cabinet at Washington; but without pronouncing any decided opinion at the present moment, I think it right to point out to your lordship that the effect of such an article as that suggested in your dispatch, as the second, might be to perpetuate an entanglement with the government of the United States, and to place that government in a position to question or control the free action of Her Majesty's Government in everything that relates to Central America. The Clayton-Bulwer treaty has been a source of unceasing embarrassment to this country, and Her Majesty's Government, if they should be so fortunate as to extricate themselves from the difficulties which have resulted from it, will not involve themselves, directly or indirectly, in any similar difficulties for the future.

Her Majesty's Government would have no objection to enter with the United States into a self-denying engagement such as that suggested in your first article, by which both parties should renounce all exclusive advantage in the use of any of the interoceanic routes, and should bind themselves, each to the other, not to interfere with free transit. Such an article would be a suitable substitute for the Clayton-Bulwer treaty, for it would secure, as regards the contracting parties, the avowed object of that treaty—the freedom of interoceanic communication.

But beyond this Her Majesty's Government, as at present advised, are not prepared to contract any engagement as a substitute for the Clayton-Bulwer treaty, and from the abrogation of that compact, if it should take place, they will hold themselves as free to act in regard to Central America in the manner most conducive to the advancement of British interests and the fulfillment of British obligations as if the treaty had never been concluded.

Your lordship was, therefore, perfectly right in using decided language such as that reported in your dispatch respecting the Bay Islands; and whenever the subject of the abrogation of the Clayton-Bulwer treaty is mooted in your presence, you will make it perfectly clear to the Government of the United States that to abrogate the treaty is to return to the *status quo ante* its conclusion in 1850; that Her Majesty's Government have no kind of jealousy respecting American colonization in Central America, which, indeed, it would help to civilize; and that we neither ask nor wish for any exclusive privileges whatever in those regions.

These, then, were the terms upon which Her Majesty's Government were alone prepared, if at all, to consider the abrogation of the Clayton-Bulwer treaty. And such an alternative was deprecated by General Cass in a note to Lord Napier of the 6th April, 1858, in which, while

declining the proposal of arbitration on the disputed points of the treaty, he alluded to a personal expression of opinion he had given in favor of an unconditional renunciation of the treaty, and called attention to the serious consequences which might result from its dissolution if no provision were made at the same time for adjusting the questions which led to it. He then concluded with the passage quoted by Mr. Blaine, to the effect that "if the President does not hasten to consider now the alternative of repealing the treaty of 1850 it is because he does not wish prematurely to anticipate the failure of Sir William Ouseley's mission, and is disposed to give a new proof to Her Majesty's Government of his sincere desire to preserve the amicable relations which now happily subsist between the two countries."

But subsequent events make it unnecessary to dwell further upon this part of the discussion, for the question was settled by the practical accomplishment of that which the United States Government regarded as the most satisfactory conclusion.

It is here that the extracts and account of the negotiation given by Mr. Blaine come to an end at a point when the most important episode commences. The continuation of the correspondence shows that on the 30th April, 1859, a treaty was concluded between Great Britain and Guatemala for the settlement of the question of the boundary of Belize; that on the 28th November, 1859, another treaty was concluded between this country and Honduras for the transfer of the Bay Islands to that republic, as well as for the settlement of other questions relating to the Mosquito Indians and the claims of British subjects, including the withdrawal of the British protectorate, and that on the 28th January, 1860, a third treaty was concluded between this country and Nicaragua, also with reference to the Mosquito Indians and the claims of British subjects.

Copies of these three treaties were officially communicated to the United States Government, with the expression of a hope on the part of Her Majesty's Government that they would "finally set at rest the questions respecting the interpretation of the Clayton-Bulwer treaty, which had been the subject of so much controversy between this country and the United States."

And in his message to Congress of the 3d December, 1860, President Buchanan says the dangerous questions arising from the Clayton-Bulwer treaty "have been amicably and honorably adjusted. The discordant constructions of the Clayton-Bulwer treaty between the two governments, which at different periods of the discussion bore a threatening aspect, have resulted *in a final settlement entirely satisfactory to this government.*"

I have been forced to give the above extracts at considerable length, and I refrain from adding other passages which would tend to illustrate and confirm them. A perusal of them, however, will, I think, suffice to show—

1. That the differences which arose between the two governments in regard to the treaty, and which occasioned at one time considerable irritation, but which have long since been happily disposed of, did not relate to the general principles to be observed in regard to the means of interoceanic communication across the isthmus, but had their origin in a stipulation which Mr. Blaine still proposes in great part to maintain. He wishes every part of the treaty in which Great Britain and the United States agree to make no acquisition of territory in Central America to remain in full force, while he desires to cancel those portions of the treaty which forbid the United States fortifying the canal and

holding the political control of it in conjunction with the country in which it is located.

2. That the declarations of the United States Government during the controversy were distinctly at variance with any such proposal as that just stated. They disclaimed any desire to obtain an exclusive or preferential control over the canal. Their sole contention was that Great Britain was bound by the treaty to abandon those positions on the mainland or adjacent islands which in their opinion, were calculated to give her the means of such a control. Nor did they in any way seek to limit the application of the principles laid down in the treaty so as to exclude Colombia nor Mexican territory, as Mr. Blaine now suggests, nor urge that such application would be inconsistent with the convention between the United States and New Granada of 1846. On the contrary, they were ready to give those principles their full extension.

3. That at a time when the British Government had been induced by the long continuance of the controversy to contemplate the abrogation of the treaty, they were only willing to do so on the condition of reverting to the *status quo ante* its conclusion in 1850; a solution which was at that time possible, though, as the United States Government justly pointed out, it would have been fraught with great danger to the good relations between the two countries, but which is now rendered impossible by the subsequent events.

4. That a better and more conciliatory conclusion, which for twenty years has remained undisputed, was effected by the independent and voluntary action of Great Britain. The points in dispute were practically conceded by this country, and the controversy terminated in a manner which was declared by President Buchanan to be amicable and honorable, resulting in a final settlement entirely satisfactory to the Government of the United States.

You are authorized to read this dispatch to the United States Secretary of State, and to offer him a copy of it if he should desire, in the same manner in which a copy of Mr. Blaine's dispatch was offered to me.

I have, &c.,

GRANVILLE.

The Hon. L. S. S. WEST.

76.—*Mr. Lowell to Mr. Frelinghuysen.*

No. 376.] LEGATION OF THE UNITED STATES,
London, June 1, 1882. (Received June 13.)

SIR: I have the honor to acknowledge the reception of your instruction No. 368, of the 8th of May last, stating the position of the Government of the United States in relation to questions growing out of the (so-called) Clayton-Bulwer treaty. It arrived on the 27th ultimo, when the members of the government were leaving town for the Whitsuntide holidays. I have had no opportunity of seeing Lord Granville until yesterday, when I had an interview with him, by appointment, at the foreign office. I read the dispatch to him and left a copy of it with him, at his request, agreeably to your directions. I have already informed you of this by cable.

I have, &c., J. R. LOWELL.

47TH CONGRESS, 1st Session. } SENATE. { EX. DOC. No. 195.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING,

In response to Senate resolution of April 25, 1882, a communication, with accompanying papers, from the Secretary of the Navy, in relation to the title by which the United States holds the land now occupied as a navy-yard at Boston, Mass.

AUGUST 5, 1882.—Read and ordered to lie on the table and be printed.

OFFICE OF THE PRESIDENT OF THE UNITED STATES,
Washington, August 4, 1882.

To the Senate of the United States:

In reply to a resolution of the Senate, passed April 25, 1882, I transmit, herewith, a communication, with accompanying papers, from the Secretary of the Navy, in relation to the title by which the United States holds the land now occupied as a navy-yard at Boston, Mass.

CHESTER A. ARTHUR.

NAVY DEPARTMENT,
Washington, August 4, 1882.

SIR: I have the honor to acknowledge the receipt of Senate resolution, dated April 25, 1882, requesting

> The President of the United States to communicate to the Senate any information in the possession of the Executive or head of any department touching the title by which the United States holds the navy-yard at Boston, Mass., and the capacity of the United States to convey a valid title thereto;

and, in compliance with your directions, to submit the following statement, with accompanying papers, for the information of the Senate.

The land included within the limits of the navy-yard at Charlestown, Mass., was purchased by the United States under authority of, and in conformity with, an act of the legislature of Massachusetts, passed June 17, 1800, entitled "An act authorizing the United States to purchase a tract of land in Charlestown for a navy-yard." A copy of the act is appended, marked A.

By this act the legislature consented to the purchase, by the United States, of a tract of land in Charlestown for a navy-yard, not exceeding sixty-five acres, exclusive of flats, and ceded jurisdiction of the same. The act also provided that, in case of disagreement in the sale and purchase of the land or any portion thereof, the value of the land should be ascertained in the manner therein prescribed; and that, upon payment

of the amount so ascertained, to the owner or owners, the land so valued and paid for should be forever vested in the United States.

The first purchases of the land referred to were made in the years 1800 and 1801 by Aaron Putnam, as agent of the United States, and title to the various parcels of land then and subsequently purchased was acquired in the order in which they are numbered on the accompanying plat of the navy-yard, which, with an abstract showing the quantity of land contained in each purchase, by whom it was conveyed, date of purchase, and the consideration paid, is hereto appended, marked B. Title in fee to all of the land, except the parcels obtained from Ebenezer Breed and John Harris, was acquired by voluntary sale and conveyance to the United States.

In purchasing from Ebenezer Breed and John Harris the parcels of land designated on the plat as lots 6, 7, 8, and 9 (Appendix B), the agent of the United States acquired title to each lot in the manner prescribed by the act of the legislature authorizing the purchase to be made. A copy of the proceedings had in each of these cases is appended, marked C.

On the 21st of February, 1801, Ebenezer Breed gave to the United States a receipt (copy appended, marked D,) in which he acknowledged payment in full of the appraised value of lot 8, and guaranteed title to the same. On the same day Ebenezer Breed and wife, by deed containing the usual covenants (copy appended, marked E), conveyed to the United States the land designated as lot 9.

John Harris, by two receipts, dated respectively, November 29, 1800, and February 6, 1801 (copies of which are hereto appended, marked F), acknowledged payment in full by the United States of the appraised value of lots numbered 6 and 7, guaranteeing the title. At the dates of purchase of these parcels of land from John Harris, certain streets, called Battery or Water street and Henley or Meeting House street, had been laid out and opened by the town of Charlestown through the land owned by him. These streets, so far as they were within the limits of the navy-yard, were closed up and discontinued in 1801, by the town of Charlestown, and by grant of that town were taken possession of by the United States, and incorporated in the navy-yard, and have ever since been used as a part of the yard.

I transmit a copy of a paper on file in this department (Appendix G), reciting the proceedings of a town meeting in Charlestown, January 10, 1801, when the above-mentioned grant was made, in which the fol lowing is stated as a condition of the grant:

> *Provided, however*, That if the navy and dock yard should be discontinued, or the land be converted by the United States to private purposes, these grants shall be void; and the aforesaid streets and passages shall be opened as before for the use and accommodation of the town.

Mr. Harris, at this time, protested against this grant by the town, "on account of his rights to the advantages of the said streets."

In 1830, the heirs of Harris, having claimed, by devise and heirship, title to, and right of possession in, the land within the streets which had been discontinued or extinguished, and granted to the United States by the town of Charlestown, the question arose whether the United States had acquired any title to the premises in controversy; and upon the suggestion of the Attorney-General, an action of trespass was brought by the United States in the United States circuit court for the district of Massachusetts, to determine the title to the property referred to. The decision of the court in this case ——— —— (1 Sumner, 21), which was adverse to the United States, was affirmed by the Supreme

Court (10 Peters, 25); and on the 6th of July, 1840, the Secretary of the Navy, under authority of the act of Congress, approved March 3, 1839, purchased from the heirs of Harris the premises referred to; receiving from them a deed conveying title to the land in question, and in which they relinquish all their right, title, and estate in and to the lands within the limits of the yard which formerly belonged to or was claimed by John Harris. (A copy of the deed is appended, marked H.)

The value of the land taken from Ebenezer Breed, as ascertained by a jury, in the manner prescribed by the act of the legislature, was accepted by him in full payment therefor, and the United States thereby acquired a complete title in fee to that portion of the land. (Dingley *vs.* City of Boston, 100 Mass., 544; Rexford *vs.* Knight, 1 Kernan, N. Y., 308; Heyward *vs.* The Mayor of New York, 3 Selden, 214; Malone *vs.* The City of Toledo, 34 Ohio, 541.)

It will be seen from the foregoing statement that the United States holds a title, in fee simple, to all the land now occupied as a navy-yard at Boston (Charlestown), Mass.; and, in the event of a discontinuance of the use of the land for the purposes of a navy-yard, that the United States can convey a valid title thereto, subject, however, to any right that may remain in the city to reopen the streets, the use of which was discontinued or extinguished by the town of Charlestown in the year 1801.

I have the honor to be, sir, very respectfully, your obedient servant,

WM. E. CHANDLER,
Secretary of the Navy.

The PRESIDENT.

A.

AN ACT authorizing the United States to purchase a tract of land in Charlestown for a navy-yard.

SECT. 1. *Be it enacted by the Senate and House of Representatives in General Court assembled and by the authority of the same,* That the consent of this Commonwealth be, and hereby is, granted to the United States to purchase a tract of land situated in the northeasterly part of the town of Charlestown, in the county of Middlesex, adjoining and bounded on two sides by Charles and Mystick Rivers, not exceeding sixty-five acres, exclusive of flatts, for the purpose of a navy or dock yard, or both of them, and erecting magazines, arsenals, and other needfull buildings. The evidence of the purchase aforesaid to be entered and recorded in the registry of deeds in the said county of Middlesex. Provided always: and the consent aforesaid is granted upon the express condition, That this Commonwealth shall retain a concurrent jurisdiction with the United States in and over the tract of land aforesaid, so far as that all civil and such criminal processes as may issue under the authority of this Commonwealth against any person or persons charged with crimes committed without the said tract of land may be executed therein in the same way and manner as though this consent had not been granted.

SECT. 2D. *And be it further enacted,* That if the agent or agents employed for the United States and the owner or owners of said tract of land so to be purchased cannot agree in the sale and purchase thereof, such agent or agents may apply to any court of general sessions of the peace which shall be holden within and for the aforesaid county of Middlesex; which court, after due notice given to the said owner or owners, are hereby empowered and directed to hear and finally determine the value of the same tract of land or any part or portion thereof by a jury under oath, to be summoned by a sheriff or his deputy for that purpose; or by a committee of three persons if the parties aforesaid can agree upon them; and the value thereof being thus ascertained by the verdict of such jury or the report of such committee, who are also to be under oath faithfully and impartially to value said tract of land or any portion of the same; and such verdict or report being accepted and recorded by said court and the amount thereof being paid or tendered to the owner or owners of said tract of land or to the owner or owners of any part of said tract of land that shall have been thus valued with his or her reasonable costs; the said tract of land, or

such parts of the same as shall be thus valued, shall forever be vested in the United States, and shall and may be by them taken, possessed, and appropriated to the purposes aforesaid.

This Act passed June 17, 1800. (See Massachusetts Laws, edition of 1807, volume 2, page 940.)

The above is copied from the book.

A. BINNEY.

MAY 21, 1821.

B.

Abstract of deeds relating to the title of the United States to the navy-yard at Charlestown, Mass.

LOT No. 1.

(Containing 4 acres and 26 rods.)

Aaron Putnam to United States. Deed dated August 26, 1800. Conveyance in fee. Consideration, $3,000.

LOT No. 2.

(Containing 2 acres and 2 rods.)

William Calder to United States. Deed dated August 26, 1800. Conveyance in fee. Consideration, $1,000.

LOT No. 3.

(Containing 1 acre, 2 roods, and 20 rods.)

Richard Boylston to United States. Deed dated August 26, 1800. Conveyance in fee. Consideration, $6,000.

LOT No. 4.

(Containing 3 acres, 1 rood, 39 rods.)

Catharine Henley (widow), Catharine Henley, jr. (single), Rebecca Gray Henley to United States. Deed dated August 30, 1800. Conveyance in fee. Consideration, $1,500.

LOT No. 5.

(Containing 3 acres and 8 rods, and flats on water front.)

John Larkin to United States. Deed dated October 27, 1800. Conveyance in fee. Consideration, $1,016.

LOTS No. 6.

(Containing 8 acres, 3 roods, 35 rods.)

John Harris to United States. Receipt dated November 29, 1800. Consideration, $16,587, amount awarded by jury in this case.

LOT No. 7.

(Containing three-quarters of an acre.)

John Harris to United States. Receipt dated February 6, 1801. Consideration, $500, amount awarded by jury in this case.

LOT No. 8.

(Containing 3 acres and 36 rods.)

Ebenezer Breed to United States. Receipt dated February 21, 1801. Consideration, $1,950, amount awarded by jury in this case.

LOT No. 9.

(Containing 7 acres and 36 rods.)

Ebenezer Breed to United States. Deed dated February 21, 1801. Conveyance in fee. Consideration, $3,893.92. This is a portion only of the tract of Ebenezer Breed's land, containing 11 acres and 91 rods, which was appraised by jury at $6,235.

LOT No. 10.

Aaron Putnam to United States. Deed dated April 2, 1801. Conveyance in fee. Consideration, $7,300.

LOT No. 11.

(Containing 4,313 square feet.)

United States to Salem Pike and Bridge Company. Deed dated April 12, 1804. Conveyance in fee. Consideration, $350.

LOT No. 12.

(Containing 5,186 square feet.)

Isaac Hull to United States. Deed dated August 15, 1817. Conveyance in fee. Consideration, $3,889.50.

LOTS No. 13.

(Parts of Battery or Water street and Henley or Meeting-House street.)

John Harris's heirs to United States. Deed dated July 6, 1840. Conveyance in fee. Consideration, $45,218.59. In this deed the heirs of Harris relinquish all their right, title, and estate in and to the lands which formerly belonged to or were claimed by John Harris now within the limits of the navy-yard.

LOT No. 14.

(Containing 101,050 square feet.)

Oakman & Eldredge to United States. Deed dated July 1, 1862. Conveyance in fee. Consideration, $123,000.

LOT No. 10.

(Land purchased to widen the main entrance to navy-yard.)

Ann M. H. Hull to United States. Deed dated October 4, 1866. Conveyance in fee. Consideration, $7,000.

C.

[SEAL.] COMMONWEALTH OF MASSACHUSETTS,
Middlesex, ss:

At a court of the general sessions of the peace begun & holden at Concord, within & for the county of Middlesex, on the Monday next preceeding the second Tuesday of September, being the eighth day of said month, anno Domini 1800, Aaron Putnam, agent of the United States of America, by his petition to this court respectfully sheweth that he having been directed by the Government of the United States to purchase a certain tract of land in Charlestown for a navy & dock yard for the United States, & not being able to agree with Ebenezer Breed, of said Charlestown, for sundry lots of land belonging to him, which lots are within the limits pointed out by government—

The said Putnam therefore prays that this court would order the sheriff of said county to summons a jury to appraise and value said lots or tracts of land, that the United States may possess the same at a fair and equitable value, agreeable to the law of this Commonwealth in that case made and provided.

The court, on reading the foregoing petition on the fourth day of the term, order

that the petitioner notify the said Ebenezer Breed, by serving him on the morrow with an attested copy of said petition & of this order thereon, that he may appear before the justices of said court at Concord aforesaid, on Wednesday next, the seventeenth day of September instant, at ten of the clock in the forenoon, to shew cause (if any he has) why the prayer of said petition should not be granted.

And now, on this seventeenth day of September, the said Aaron Putnam & the said Ebenezer Breed appear, & after a full hearing of the parties the court order that a warrant issue to the sheriff of the county of Middlesex, to summons a jury of twelve good & lawful men, freeholders within the same county, & to cause them to be duly sworn & in other respects conformably to the law in this behalf made & provided, which warrant to be made returnable here on the twentieth day of October next, to which time this court is continued by adjournment.

And now, on this twentieth day of October, Joseph Hosmer, esquire, sheriff of said county of Middlesex, makes returns here of the warrant to him directed pursuant to the foregoing order of court, together with the certificate of the oath administered to the jurors by him summoned, the verdict of said jury, and his doings on the same warrant, in the words & figures following, viz:

COMMONWEALTH OF MASSACHUSETTS,
Middlesex, ss:

To the sheriff of our county of Middlesex aforesaid, greeting:

Whereas, by an act of the legislature of said Commonwealth passed on the seventeenth day of June last past, the consent of said commonwealth is granted to the United States to purchase a tract of land situated in the northeasterly part of the town of Charlestown, in said county of Middlesex adjoining, and bounded on two sides by Charles & Mystic Rivers, not exceeding sixty-five acres, exclusive of flatts, for the purpose of a navy or dock yard, or both of them, & erecting magazines, arsenalls, and other needful buildings, in the manner and upon the condition therein expressed;

And whereas Aaron Putnam, agent for said United States, by his petition addressed to the justice of our court of general sessions of the peace, holden at Concord, within and for said county of Middlesex, on the Monday next preceding the second Tuesday of September instant, has represented to said court that having been authorized to purchase for said United States a certain tract of land in said Charlestown for a navy and dock yard for the United States, and not being able to agree with Ebenezer Breed of said Charlestown for sundry lots of land belonging to him, which lots are within the limits aforesaid, and said Putnam, by his said petition, has prayed said court to issue a warrant to you the said sheriff to summons a jury to appraise and value said tracts or lots of land, that said United States may possess the same at a fair and equitable value, agreeable to the act aforesaid;

And whereas said court, after due notice to the said Breed, and having fully heard him in the premises, have directed that an order or warrant should issue accordingly;

You are therefore hereby authorized and required forthwith to summon a jury of twelve good and lawful men, freeholders within the same county, and cause them to be duly sworn, & having given due notice to the said Ebenezer Breed and the said Aaron Putnam to repair with said jury to said tracts or lots of land, and to cause them to set out said tracts or lots of land by metes and bounds, and faithfully and impartially to appraise and value the same.

Hereof fail not, and make due return of this precept with your doings herein, under your own hand, together with the verdict of the jury in the premises, under each of their hands and seals, unto our said court of general sessions of the peace, at Concord aforesaid, on Monday, the twentieth day of October next, to which time and place said court is continued by adjournment.

Witness, James Winthrop, esq., at Cambridge, the twenty-seventh day of September, in the year of our Lord one thousand eight hundred.

[SEAL.] ABR. BIGLAW, *Clk.*

COMMONWEALTH OF MASSACHUSETTS,
Middlesex, ss:

CHARLESTOWN, *October 2d*, 1800.

Then Roger Brown, George Minot, William Merriam, Abijah Thompson, jr., Samuel Jaques, Nathan Parker, Edward Wade, Barnard Green, Jonathan Porter, Nathaniel Hall, Josiah Moore, and John Walton, being duly returned as jurors, personally appeared, were impanelled and sworn faithfully & impartially to appraise and value such lands as should be shown to them for valuation according to the directions of the annexed warrant, and to return a true verdict thereof, according to the law in such case made and provided. Before me,

JOSIAH BARTLETT,
J. Pacis.

MIDDLESEX, *ss:*

OCTOBER 4TH, 1800.

We, the jury empanelled & sworn as before certified, having been shewn sundry lots of land belonging to said Ebenezer Breed, lying within the limits mentioned in the act in this case made and provided, and fully heard the said Ebenezer Breed, as well as Aaron Putnam, esq., agent for the United States, together with the testimony by them respectively produced, touching the value of said lots, we have set out the said lots by metes and bounds, and do appraise and value the same as follows, viz:

One lot containing eleven acres & ninety-one square rods, called the dam pasture or brick yard lot, bounded thus, beginning at the southerly corner thereof at a stake & stones one rod south from the end of the ditch wall, at a corner of a lot lately belonging to David Stearns; thence the line runs northeasterly on said Stearn's lot, keeping one rod south from said ditch wall to a stake and stones; thence southerly to the end of the rail fence on the beach, and so on to low-water mark. Again, beginning at said first mentioned bounds the line runs thence northerly, easterly, & southeasterly, as the fence now stands, till it comes to a corner of land lately belonging to Catherine Henley at a proprietor's way; from thence southerly on said Henley's land to low-water mark; thence westerly on said low-water mark to where the same is intersected by the second line above described, together with a barn standing on said lot, and we do on our oaths appraise and value the same at six thousand two hundred and thirty-five dollars, and no more.

Also one other lot at the point called Moulton or Charlestown Point, containing three acres and thirty-six rods more or less, bounded thus: Beginning at the northwesterly corner thereof, at the place where said proprietor's way now ends, thence the line runs northeasterly on land lately belonging to said Aaron Putnam, esq., as the fence now stands, to low-water mark in Mystic River. Again, beginning at said northwesterly corner, the line runs thence southeasterly on land lately belonging to William Calder, as the fence now stands, to low-water mark in Charles River; thence on low-water mark round the points to the place where the same is intersected by said first mentioned line; and we do, on our oaths, appraise and value the same lot at one thousand nine hundred & fifty dollars, and no more.

Also, one other lot containing eight acres and twelve rods more or less, bounded southeasterly on said Putnam's land, southwesterly on said proprietor's way, and northwesterly on a rope walk & land reputed to belong to James Andrews, as the fence and said rope walk now stands, and northeasterly on Mystic River by protracting the two side lines of said lot from the corner of the fence nearest said river, in each case pursuing the direction of the fence to low-water mark; and we do, on our oaths, appraise and value the said lot at five thousand nine hundred & eight dollars, and no more.

In testimony of all which we, the said jury, do hereunto set our hands and seals the day and year above mentioned.

The interlining was done before signing.

ROGER BROWN and a seal.
GEORGE MINOT and a seal.
JON'A PORTER and a seal.
ABIJAH THOMPSON, JR., and a seal.
WILLIAM MERIAM and a seal.
JOHN WALTON and a seal.
JOSIAH MOORE and a seal.
NATH'L HALL and a seal.
SAMUEL JAQUES and a seal.
EDWARD WADE and a seal.
BARNORD GREEN and a seal.
NATHAN. PARKER and a seal.

Jurors' fees: Time, horse hire, & expenses, $85.87.

MIDDLESEX, *ss:*

OCTOBER 20TH, 1800.

In obedience to the annexed warrant, I summoned a jury of twelve good & lawful men, freeholders within the same county, viz, Roger Brown, esquire, & George Minot, gentlemen, both of Concord; William Meriam, of Bedford, yeoman, and Abijah Thompson, of Woburn, esquire; Samuel Jaques, of Wilmington, gentleman; Nathaniel Parker, of Reading, esq.; Edward Wade, yeoman, and Barnord Green, esquire, both of Malden; Jonathan Porter, merchant, and Nathaniel Hall, yeoman, both of Medford; Josiah Moore, yeoman, & John Walton, gentleman, both of Cambridge, all in said county, to appear at the dwelling-house of Thomas Robbins, innholder, in Charlestown, in said county, on the second day of October instant, having previously given seasonable notice to the said Aaron Putnam & to the said Ebenezer Breed of the time and place of meeting of the said jury, and they, the said Breed & Putnam, having

assented to the said time & place, & I having caused the said jurors to be impannelled & sworn, as is on the said warrant certified, repaired with the said jury to the lots & tracts of land in the said warrant mentioned, & caused the said jurors, after viewing said lots of land & fully hearing the said parties, to set out the said lots and tracts by metes and bounds, & faithfully & impartially to appraise & value the same and return a true verdict thereof under each of their hands & seals, which verdict is hereunto annexed.

JOSEPH HOSMER, *Sheriff.*

All which, being seen & fully understood by the court, is accepted & ordered to be recorded, & on motion of said Breed for costs, the court, for his reasonable costs, do allow the sum of twelve dollars.

The foregoing is a true copy of the record of the court of sessions for the county of Middlesex.

In testimony whereof I have hereunto set my hand & the seal of said court this thirteenth day of March, in the year of our Lord one thousand eight hundred and one.

ABR'M BIGLAW, *Clk.*

MIDDLESEX, *ss:*

CAMBRIDGE, 17 *March*, 1801.

Received and entered by

SAMUEL BARTLETT, *Reg'r.*

The foregoing is a true copy of record, Book 141, pages 31 to 37.
Attest:

SAML. BARTLETT, *Register.*

C. (Ist.)

COMMONWEALTH OF MASSACHUSETTS,
Middlesex, ss:

At a court of general sessions of the peace, begun and holden at Concord within and for the county of Middlesex, on the Monday next preceeding the second Tuesday of September, being the eighth day of said month, anno Domini 1800, Aaron Putnam, agent of the United States of America, by his petition to this court respectfully sheweth:

That he having been directed by the Government of the United States to purchase a certain tract of land in Charlestown, for a navy & dock yard, for the United States, and not being able to agree with John Harris, of said Charlestown, for sundry lots of land belonging to him, which lots are within the limits pointed out by government—

The said Putnam therefore prays that this court would order the sheriff of said county to summon a jury to appraise and value said lots or tracts of land, that the United States may possess the same at a fair and equitable value, agreeable to a law of this Commonwealth in that case made & provided.

The court, on reading the foregoing petition on the fourth day of the term, order that the petitioner notify the said John Harris by serving him on the morrow an attested copy of said petition, and of this order thereon, that he may appear before the justices of said court at Concord aforesaid, on Wednesday next, the seventeenth day of September instant, at ten of the clock in the forenoon, to shew cause (if any he has) why the prayer of said petition should not be granted.

And now, on this seventeenth day of September, the said Aaron Putnam and the said John Harris appear, and, after a full hearing of the parties, the court order that a warrant issue to the sheriff of the county of Middlesex, to summon a jury of twelve good and lawful men—freeholders within the same county—and to cause them to be duly sworn and in other respects conformably to the law in this behalf made and provided, which warrant to be made returnable here on the twentieth day of October next, to which time this court is continued by adjournment.

And now, on this twentieth day of October, Joseph Hosmer, esquire, sheriff of said county of Middlesex, makes return here of the warrant to him directed pursuant to the foregoing order of court, together with the certificate of the oath administered to the jurors by him summoned. The verdict of said jury and his doings on the same warrant, in the words and figures following, viz:

COMMONWEALTH OF MASSACHUSETTS,
Middlesex, ss:

To the sheriff of our county of Middlesex, aforesaid, greeting:

Whereas, by an act of the legislature of said Commonwealth, passed on the seventeenth day of June last past, the consent of said Commonwealth is granted to the

United States to purchase a tract of land situated in the northeasterly part of the town of Charlestown, in said county of Middlesex, adjoining and bounded on two sides by Charles and Mystic Rivers, not exceeding sixty-five acres, exclusive of flats, for the purpose of a navy or dock yard, or both of them, and erecting magazines, arsenals, and other needful buildings, in the manner and upon conditions therein expressed;

And whereas Aaron Putnam, agent for said United States, by his petition addressed to the justices of our court of general sessions of the peace, holden at Concord, within and for said county of Middlesex, on the Monday next preceding the second Tuesday of September instant, has represented to said court that having been authorized to purchase for said United States a certain tract of land in said Charlestown for a navy or dock yard for the United States, and not being able to agree with John Harris, of said Charlestown, for sundry lots of land belonging to him, which lots are within the limits aforesaid, and said Putnam by his said petition has prayed said court to issue an order to you, the said sheriff, to summon a jury to appraise and value said tracts or lots of land, that said United States may possess the same at a fair and equitable value agreeably to the act aforesaid.

And whereas said court, after due notice to said Harris, & having fully heard him in the premises, have directed that an order or warrant should issue accordingly, You are, therefore, hereby authorized and required forthwith to summon a jury of twelve good & lawful men, freeholders within the same county, and cause them to be duly sworn, and having given due notice to the said John Harris *Harris*, and to the said Aaron Putnam, to repair with said jury to said tracts or lots of land, and cause them to set out said tracts or lots of land by metes and bounds, and faithfully and impartially to appraise & value the same. Hereof fail not, and make due return of this precept, with your doings hereon under your own hand, together with the verdict of the jury in the premises under each of their hands & seals, into our said court of general session sof the peace, at Concord aforesaid, on Monday, the twentieth day of October next, to which time and place said court is continued by adjournment.

Witness: James Winthrop, esq., at Cambridge, this twenty-seventh day of September, in the year of our Lord one thousand eight hundred.

ABR'M BIGLOW, *Clerk.*

COMMONWEALTH OF MASSACHUSETTS,
Middlesex, ss:

CHARLESTOWN, *October 2d*, 1800.

Then Roger Brown, George Minot, William Meriam, Abijah Thompson, jr., Samuel Jaques, Nathan Parker, Edward Wade, Barnard Green, Jonathan Porter, Nathaniel Hall, Josiah Moore and John Walton, being duly returned as jurors, personally appeared, were impannelled & sworn faithfully and impartially to appraise and value such land as should be shewn them for valuation according to the directions of the annexed warrant and to return a true verdict thereof according to the law in such case made and provided. Before me,

JOSIAH BARTLETT,
Jus Pacis.

MIDDLESEX, *ss:*

OCTOBER 4TH, 1800.

We, the jury impannelled & sworn as before certified, having been shewn several lots of land, which belong to John Harris, of Charlestown, in the county of Middlesex, merchant, lying within the limits mentioned in the act in this case made and provided, & fully heard the said Harris as well as Aaron Putnam, esq., agent for the United States, together with the testimony by them respectively produced, touching the value of said lots, we have set out the said lots by metes & bounds, & do appraise & value the same as follows, viz:

One lot containing five acres two quarters and thirty-five rods, bounded as follows: Beginning at the northeasterly corner of Amos Samson's land by the lane which leads to the brick yards, thence running southerly as the fence now stands, partly by the land of the said Samson, and partly by land of Thomas Harris, to the street laid out from the meeting-house to Charles River, thence running easterly on the same street until it comes to a cedar post marked with stones about it, thence running in the same direction to a stake and stones, thence running northerly on a straight line to a post in the fence with the top hewn on all sides, thence running still northerly as the fence now stands, to the lane first mentioned, thence running westerly by the same lane to the place first mentioned, which same tract of land, on our oaths we do appraise and value at thirteen thousand dollars and no more.

Also one other lot of land, with the appurtenances, containing one-half of an acre, bounded as follows, viz; Beginning at a stake & stones by the street lately laid out from the meeting-house to Charles River, thence running southerly by land of Thomas Edes until it comes to a post in the southeasterly corner of said Edes's fence, by Battery street, thence running northerly by the same street until it comes to a stake & stones standing where the same street meets the street lately laid out as aforesaid,

thence running southwesterly by the same street to the stake & stones first mentioned, which same tract & lot of land we do on our oaths appraise & value at thirteen hundred dollars, and no more.

Also one other lot of land, containing one acre and two quarters, more or less, bounded as follows, viz: Beginning at a stake and stones, where Wapping street and Battery street intersect each other; thence running northeasterly by Battery street to a stake and stones by land claimed by the said Edes, and in dispute between him and the said Harris; thence running southeasterly by same land to low-water mark; thence running southwesterly to low-water mark, till it comes to Wapping street aforesaid; thence westerly by the same street to the stake and stones first mentioned, which same tract of land we do on our oaths appraise and value at one thousand five hundred dollars, and no more.

Also one other tract and lot of land, containing three quarters of an acre, more or less, bounded as follows, viz: Beginning at a stake and stones by Battery street by the northwesterly corner of the lot of land last described; thence running southwesterly by the same lot of land to low-water mark; thence running northeasterly ninety-seven feet by low-water mark; thence running northwesterly on a straight line to a stake and stones, by Battery street aforesaid; thence southwesterly by the same street to the stake and stones first mentioned, which same tract of land we do on our oaths aforesaid appraise and value at five hundred dollars, & no more.

Also one other lot of land, containing one acre and one quarter, more or less, bounded as follows, viz: Beginning at a stake and stones at the northeasterly corner of the lot of land last described; thence running northeasterly by said Battery street to land of John Larkin; thence running southeasterly by land of said Larkin to low-water mark; thence southwesterly by low-water mark to the piece and lot of land last described; thence northwesterly by the same lot of land to the stake and stones first mentioned, which same lot of land we do appraise and value, on our oaths aforesaid, at the sum of seven hundred and eighty-seven dollars, and no more.

In witness wherefore we have hereunto set our hands and seals the day & year aforesaid. All the alterations and interlining was done before signing.

ROGER BROWN and a seal.
GEORGE MINOT and a seal.
JONATHAN PORTER and a seal.
ABIJAH THOMPSON, JUNR., and a seal.
WILLIAM MERIAM and a seal.
JOHN WALTON and a seal.
JOSHUA MOORE and a seal.
NATHAN'L HALL & a seal.
SAM'L JAQUES and a seal.
EDW'D WADE and a seal.
BERNARD GREEN and a seal.
NATHAN. PARKER and a seal.

Jurors' fees: Time, horse hire, & expenses, $85.87.

MIDDLESEX, *ss:*

OCTOBER 20TH, 1800.

In obedience to the annexed warrant, I summoned a jury of good and lawful men & freeholders within the same county, viz: Roger Brown, esquire, George Minot, gentleman, both of Concord; William Meriam, yeoman, of Bedford; Abijah Thompson, junr., of Woburn, esqr.; Samuel Jaques, of Wilmington, gentleman; Nathan Parker, of Reading, esqr.; Edward Wade, yeoman, & Bernard Green, esqr., both of Malden; Jonathan Porter, merchant, & Nathaniel Hall, yeoman, both of Medford; Josiah Moore, yeoman, & John Waltou, gentleman, both of Cambridge, and all in said county, to appear at the dwelling house of Thomas Robbins, innholder, in Charlestown, in said county, on the second day of October instant, having previously given seasonable ———— to the said Aaron Putnam & to the said John Harris of the time and place of the meeting of the said jury; and they, the said Harris & Putnam, having assented to the said time & place, & I having caused the said jurors to be impannelled & sworn, as is on the said warrant certified, repaired with the said jury to the lots and tracts of land in the said warrant mentioned, and caused the said jurors, after viewing said lots and tracts of land, & fully hearing the said parties, to set out the said lots and tracts of land by metes & bounds, and faithfully & impartially to appraise and value the same, and return a true verdict thereof under each of their hands and seals, which verdict is hereunto annexed.

JOSEPH HOSMER, *Sheriff.*

All which, being seen & fully understood by the court, is accepted and ordered to be recorded. And on motion of the said Harris for costs, the court for his reasonable costs do allow the sum of twelve dollars.

The foregoing is a true copy of the record of the court of sessions for the county of Middlesex.

In testimony whereof I have hereto set my hand & seal of said court, this thirteenth day of March, in the year of our Lord one thousand eight hundred and one.

ABR'M BIGLOW, *Cl'k.*

MIDDLESEX, *ss:*

CAMBRIDGE, 17*th March*, 1801.

Received and entered by—

SAMUEL BARTLETT, *Reg'r.*

The foregoing is a true copy of record. Book 141, pages 41 to 48, inclusive.
Attest:

SAM. BARTLETT, *Register.*

D.

I, Ebenezer Breed, of Charlestown, in the county of Middlesex, and Commonwealth of Massachusetts, tinman, do hereby acknowledge to have received this day of the United States of America, through the hands of their special agent, Aaron Putnam, esquire, of said Charlestown, the sum of nineteen hundred and fifty dollars, which sum is the amount awarded to me by the verdict of a jury in said county of Middlesex, for a certain lot of land lying in said town of Charlestown, which was lately entered upon and located by said Putnam in behalf of said United States, as part of the land whereon to establish a dock & navy yard, pursuant to the authority given and a process provided for and in behalf of said United States by virtue of an act of the legislature of the Commonwealth of Massachusetts, passed on the fourth day of June last, which process and all the proceedings thereon will fully appear by a reference to the records thereof, in the clerk's office of the court of general sessions of the peace, within and for said county of Middlesex, which piece or lot of land herein referred to is in the verdict and appraisement of said jury called Moulton's or Charlestown Point, containing by their estimation three acres and thirty-six rods, more or less, & therein described & bounded as follows (viz):

Beginning at the northwesterly corner thereof, at a place where a proprietor's way, so called, now stands, thence the line runs northeasterly on land lately belonging to said Aaron Putnam, as the fence now stands, to low-water mark in Mystic River. Again, beginning at said northwesterly corner, the line running thence southeasterly on land lately belonging to William Calder, as the fence now stands, to low-water mark in Charles River, thence on low-water mark round the points to the place where the same is intersected by said first-mentioned line.

And I, the said Ebenezer Breed, in consideration of the premises, do for myself, my heirs and assigns, hereby promise the said United States that, in case my title to any part of the premises herein mentioned, and paid for as aforesaid, shall hereafter be found defective and insufficient, then in such case said defect being proved and established in law I will pay to the United States the same sum which I have received from them for that part of the land the title whereof shall fail as aforesaid.

Witness my hand at Charlestown, this twenty-first day of February, anno Domini 1801.

EBENR. BREED.

In presence of—
DAVID DEVENS,
HENRY MIRICK.

MIDDLESEX *ss:* CAMBRIDGE, *March* 17, 1801.

Received and entered by—

SAMUEL BARTLETT,
Regr.

The foregoing is a true copy of record, Book 141, pages 38 & 9.
Attest:

SAMUEL BARTLETT,
Register.

E.

Know all men by these presents: That I, Ebenezer Breed, of Charlestown, in the county of Middlesex, and Commonwealth of Massachusetts, tinman, in consideration of three thousand eight hundred and ninety-three dollars 92 cents, paid by the United

States of America by their agent, Aaron Putnam, esquire, of said Charlestown, the receipt whereof I do hereby acknowledge, do hereby give, grant, sell and convey unto the said United States of America a certain lot or piece of land, lying and being in Charlestown aforesaid, containing by estimation seven acres and thirty-six rods, being part of a certain lot called dam pasture, and is butted and bounded as follows (viz):

Beginning at the southerly corner of said pasture, at a stake and stones one rod south from the end of a ditch or dam wall, at a corner of a lot lately belonging to David Stearns; thence running northeasterly thirty-eight rods and an half on said Stearns, lot, keeping one rod south of said dam or ditch wall to a stake and stones; thence southerly twenty rods and an half to the end of the rail fence on the beach, and so on to low-water mark. Again, beginning at said first-mentioned stake and stones bounded westerly on the road five rods and ten links; thence northwesterly on a strait line fifty-three rods on said Breed's land, to a stake and stones in the wall, on the proprietor's way, so called; thence on said proprietor's way, seven rods four links, till it comes to a corner of land lately belonging to Catherine Henley; from thence southerly forty rods eleven links on said Henley's land to the end of the rail fence on the beach, and so on to low-water mark; thence westerly thirteen rods on said low-water mark to where the line is intersected by the second line above described. Provided, and it is an express condition, that a certain sluice or drain which leads the water from said Breed's land shall be preserved and always kept in good repair by the United States at their own proper expense. And also that fences shall be erected and always kept in good repair on the lines of division between the land hereby conveyed and the remaining part of said dam pasture, at the expense of said United States. The premises herein granted being for the accommodation of the United States, in the establishment of a navy & dock yard, and to be improved for that purpose. To have and to hold the aforegranted premises to the United States for the purpose aforesaid, to their use and behoof forever.

And I do covenant with the said United States that I am lawfully seized in fee of the aforegranted premises, that they are free of all incumbrances, that I have good right to sell and convey the same to the said United States, and that I will warrant and defend the same premises to the said United States forever against the lawful claims and demands of all persons. It being understood by the parties to these presents that the United States taking these premises, and also a certain lot called Moulton's or Charlestown Point lot, containing three acres and thirty-six rods, do relinquish all further claim to any other land of said Breed's in Charlestown, for the purpose aforesaid.

In witness whereof I, the said Ebenezer, together with Mary Breed, my wife, in token of her relinquishment of dower in the premises, have hereunto set our hands and seals, this twenty-first day of February, anno Domini 1801.

EBENEZER BREED and seal.
MARY BREED and seal.

Signed, sealed, and delivered in presence of us:
DAVID DEVENS,
HENRY MIRICK.

COMMONWEALTH OF MASSACHUSETTS,
Middlesex, ss:

FEBRUARY 24TH, 1801.

Then the within-named Ebenezer Breed personally appeared and acknowledged this instrument by him subscribed to be his voluntary deed. Before me,

JOSIAH BARTLETT,
Justice of the Peace.

MIDDLESEX, *ss:*

CAMBRIDGE, 12*th March*, 1801.

Received and entered by—

SAMUEL BARTLETT, *Register.*

The foregoing is a true copy of record, Book 141, page 39 to 41.
Attest:

SAMUEL BARTLETT, *Register.*

F.

CHARLESTOWN, *November* 29*th*, 1800.

I, John Harris, of Charlestown, in the county of Middlesex, and Commonwealth of Massachusetts, merchant, do hereby acknowledge to have this day received of the United States of America, from the hands of their special agent, Aaron Putnam, of said Charlestown, esquire, the sum of sixteen thousand five hundred and eighty-seven dollars, which sum is the amount awarded to me by a jury in the said county of Mid-

dlesex for sundry lots of land lying in said town of Charlestown, which were lately entered upon and located by said Putnam in behalf of the United States as part of the land whereon to establish a dock & navy yard pursuant to the authority given to and a process provided for and in behalf of said United States by virtue of an act of the legislature of the Commonwealth of Massachusetts, passed on the seventeenth day of June last, which process & all the proceedings thereon will fully appear by a reference to the records thereof in the clerk's office of the court of the general sessions of the peace within and for said county of Middlesex, excepting only a lot containing by estimation three-quarters of an acre, more or less, which was appraised by said jury as my property at the sum of five hundred dollars, but which is omitted to be taken for the United States on account of a dispute relative to the title thereof now subsisting between me, the said Harris, and Thomas Edes, and for which therefore received no payment.

And I, the said John Harris, in consideration of the premises, do hereby promise the said United States that in case my title to any part of the land taken, appraised, and paid for as aforesaid, should hereafter prove to have been defective and insufficient, then, in such case, the same defect appearing clear and satisfactory in law, I will pay to the said United States the same sum which I received from them for that part of the land aforesaid the title whereof shall hereafter appear clearly to have been defective as aforesaid; and to determine the proportion of the money hereafter to be returned to the United States in case of a failure of title to any part of the premises, reference is at all times to be had to the verdict and appraisement of the jury above mentioned.

Witness my hand.

JOHN HARRIS.

In presence of—
COTTON CENTER,
THOMAS JOHNSON.

MIDDLESEX, *ss:*

CAMBRIDGE, 16*th March*, 1801.

Received and entered by—

SAMUEL BARTLETT, *Register.*

The foregoing is a true copy of record, Book 141, page 48.
Attest:

SAML. BARTLETT, *Register.*

CHARLESTOWN, *February* 6*th*, 1801.

I, John Harris, of Charlestown, in the county of Middlesex, and Commonwealth of Massachusetts, merchant, do hereby acknowledge to have this day received of the United States of America, from the hands of their special agent, Aaron Putnam, of said Charlestown, esqr., the sum of five hundred dollars, which sum is the amount awarded to me by a jury in the said county of Middlesex, for a lot of land, lying in said Charlestown, and is described in said award as follows: "A tract or lot of land, containing three-quarters of an acre, more or less, bounded as follows, viz: Beginning at a stake and stones by Battery street by the northwesterly corner of the lot of land last described, thence running southeasterly by the same lot of land to low-water mark, thence running northeasterly ninety-seven feet by low-water mark, thence running northeasterly on a straight line to a stake and stones, by Battery street, aforesaid, thence southwesterly by the same street to the stake and stones first mentioned," and which was with sundry other lots lately entered upon and located by said Putnam, in behalf of said United States, as part of the land whereon to establish a dock and navy yard pursuant to the authority given, and a process provided for and in behalf of said United States, by virtue of an act of the legislature of the Commonwealth of Massachusetts, passed on the seventeenth day of June last, which process and all the proceedings thereon will fully appear by a reference to the records thereof in the clerk's office of the court of general sessions of the peace within and for said county of Middlesex.

And I, the said John Harris, in consideration of the premises, do hereby promise the said United States that in case my title to the land taken, appraised, and paid for as aforesaid shall hereafter prove to have been defective and insufficient, then in such case the same defect appearing clear and satisfactory in law, I will pay to the said United States the same sum which I received from them for that part of the land aforesaid the title whereof shall hereafter appear clearly to have been defective, as aforesaid; reference is at all times to be had to the verdict and appraisement of the jury above mentioned.

Witness my hand.

JOHN HARRIS.

In presence of—
THOMAS JOHNSON
JOHN HARRIS.

MIDDLESEX, *ss.:*

CAMBRIDGE, 16*th March*, 1801.

Received and entered by—

SAMUEL BARTLETT, *Register.*

The foregoing is a true copy of Record Book 141, page 49.
Attest:

SAM'L BARTLETT, *Register.*

G.

At a town meeting in Charlestown, January 10th, 1801—

Voted, That the roads and streets leading into and through the lands purchased by the United States for the navy dock yard, be granted or exchanged in such manner as will accommodate the United States without injury to the town, or the inhabitants in that vicinity, and that Josiah Bartlett, Thomas Harris, David Wood, David Goodwin, and Joseph Hurd be a committee to confer with the agents of the U. S. and others immediately interested, and report to the town the particular parcels of land which are proper for the said purpose.

Voted, That this meeting be adjourned to Wednesday next, at 4 o'clock p. m.

At the adjournment January 14, 1801, the following report was then read:

The committee appointed to consider the subject of granting or exchanging the roads and streets for the accommodation of the navy dock yard, having conferred with the agent of the United States and examined the land particularly located for that purpose, beg leave to recommend that, as soon as it may be deemed necessary, the selectmen be authorized to alter the road leading from the training field to the brick yards, by an exchange of lands with Aaron Putnam, esq., in such manner as will best accommodate the United States, without injury to the proprietors of land in the vicinity, and that when Mr. Putnam (without any expense to the town) shall have completed a new road 40 feet wide, to the satisfaction of the selectmen, they be authorized & empowered to execute good & sufficient deeds of the premises. That in consideration of the benefit expected from so important an establishment, such parts of the following streets and passage-ways belonging to the town as are included in the limits of the navy-yard be granted for the sole use of the United States, and that these limitations from Main street be as follows: The street laid through the land lately belonging to Mr. John Harris, by a line across the same, from the easterly bounds of the land of Capt. Thomas Edes; the Wapping and Battery streets, by a line across the same on the easterly bounds of a passage-way 21 feet wide belonging to the town, which leads to low-water mark; the road leading to Moulton's Point, by a line across the same, from the northerly bounds of the land lately belonging to Aaron Putnam. *Provided, however,* That if the navy and dock yard should be discontinued or the land be converted by the United States to private purposes these grants shall be void, and the aforesaid streets and passages shall be opened as before, for the use and accommodation of the town. And it is further recommended that the selectmen be requested to survey and stake out the boundaries herein described, and that they be authorized and empowered, on regular application from the agent of the United States, to make all necessary arrangements agreeably to the foregoing report.

Signed by the committee.

Voted, To accept the foregoing report of the committee, and that it be recorded.

Mr. John Harris requested an entry of his protest to the report, on account of his right to the advantages to said streets.

Attested by town clerk.

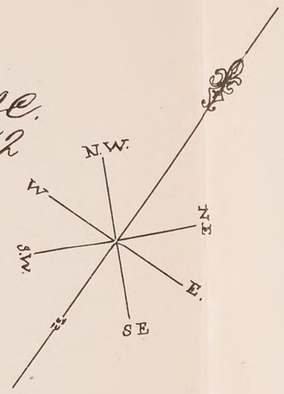
H.

Know all men by these presents, that we, Samuel D. Harris, Richard D. Harris, esquires, Charlotte Harris, Mary Harris, single women, Henry Colman, clerk, and Mary, wife of said Henry, in her right, Henry Harris, gentleman, all of Boston, in the county of Suffolk and Commonwealth of Massachusetts, John Harris, of Charlestown, in the county of Middlesex and Commonwealth aforesaid, merchant, Thomas Harris, of Brattleborough, in the county of Windham and State of Vermont, merchant, and Charles Harris, of Baltimore, in the county of Baltimore and State of Maryland, merchant, in consideration of forty-five thousand two hundred and eighteen dollars and fifty-nine cents to us paid by the United States of America, the receipt of which we hereby acknowledge, do hereby bargain, sell, release, and convey to said United States of America the following parcels of land situate within the bounds of the navy-yard

U S. Navy Yard. Boston. Mass.

Plan A

Bu Yards & Docks.
Navy Dept.
Washington D.C.
May 1882



MISTICK RIVER.

E. Breeds.

21½

low water

Easterly 50.

A. Putnam's 4..0..26.
No. 1.

Westerly 21.28

12.

10.

16.

E. Breeds

Boundary Line

Straight line 55 rods

E. Breeds 5..0..28
No. 9.

Ceded by U.S. to Salem Turnpike Co.

No 11.

Putnam's
No 10.

Swan
10.

Martha's Rope walk.

Road leading to Brick Kilns.

S 72° W

S 30° West running 81° Westerly

38½ rods northeasterly 50.16

S. 82° W. 37½

S. 5 E. to Stake

19 Links

2 Rods

J. Harris' 5..2..35
No. 6.

Henley or Meeting House Street

Easterly to cedar post. 34.17

Mill Creek

Northerly

Road leading to Moulton's Point

Water Front

D. Stearns 3..0 8
to John Larkin.
No. 5.
40.

E. Breeds
2..0..8
No. 9.

Northerly 205 rods.

No. 4.

Catherine Henley's
3..1..39

R. Boylston's
1..2..20
No. 3.

W. Calder's
2..2..0
No. 2.

E. Breeds.
3..0..36
No. 8.

8.24

4.20

10.2

3.4

2.

3307 ft.
207 rods

2667 feet. 16.

2777 ft.

13 rods

Wilping St.

1866 Hull 16.

3..1..0
J. Harris'
No. 6

¾ Acre

No. 13.

Water or Battery St.

Russell

1862
Coleman & Eldridge.
2.3198 Acres.
No. 14.

To stake & stones.

F L A T S

C H A R L E S R I V E R

SEN. EX. DOC. No. 195, 1st SESS., 47th CONG.

in said Charlestown, viz: A certain lot of land measuring four hundred feet in length and forty feet in width, formerly called Henley Street, and bounded on all sides by land of the United States; also another lot of land measuring seven hundred fifty feet in length and forty feet in width, formerly called Battery or Water Street, and bounded on all sides by land of the United States.

Also, all our right, title, and estate in and to all lands within the limits of said navy-yard, and in and to the flats in front of said navy-yard, which formerly belonged to or was claimed by John Harris, late of said Charlestown, esquire, deceased.

To have and to hold the same to the said United States of America and their assigns to their sole use and behoof for ever.

In witness whereof we the said Samuel, Richard, Charlotte, Mary, Henry, Mary, Henry, John, Thomas, and Charles, together with Abigail, wife of said Thomas Harris, and Eliza, wife of said John Harris, in token that they, said Abigail and Eliza, severally release their respective rights to dower in the above described premises, have hereunto set our hands and seals this sixth day of July, in the year of our Lord one thousand eight hundred and forty.

SAMUEL D. HARRIS,
By his attorney, RICH'D. D. HARRIS, [SEAL.]
For himself, RICH'D. D. HARRIS. [SEAL.]
CHARLOTTE HARRIS,
By her attorney, RICH'D. D. HARRIS. [SEAL.]
MARY HARRIS,
By her attorney, RICH'D D. HARRIS. [SEAL.]
HENRY COLMAN,
By his attorney, RICH'D D. HARRIS. [SEAL.]
MARY COLMAN,
By her attorney, RICH'D. D. HARRIS. [SEAL.]
HENRY HARRIS,
By his attorney, RICH'D. D. HARRIS. [SEAL.]
JOHN HARRIS,
By his attorney, RICH'D. D. HARRIS. [SEAL.]
THOMAS HARRIS,
By his attorney, RICH'D. D. HARRIS. [SEAL.]
CHARLES HARRIS,
By his attorney, RICH'D. D. HARRIS. [SEAL.]
ABIGAIL HARRIS,
By her attorney, RICH'D. D. HARRIS. [SEAL.]
ELIZA HARRIS,
By her attorney, RICH'D. D. HARRIS. [SEAL.]

Signed, sealed, and delivered in presence of us—
JAS. BENJAMIN.
WM. MINOT.

COMMONWEALTH OF MASSACHUSETTS,
Suffolk Co., City of Boston:

On the sixth day of July, in the year one thousand eight hundred and forty, Samuel D. Harris, Mary Harris, Charlotte Harris, Henry Colman, Mary Colman, Henry Harris, John Harris, Thomas Harris, Charles Harris, Abigail Harris, Eliza Harris, by their attorney, Richard D. Harris, severally acknowledged the within instrument to be their free act and deed, and said Richard D. Harris acknowledged the same to be his free act and deed. Before me.

WM. MINOT,
Justice of the Peace.

COMMONWEALTH OF MASSACHUSETTS,
Middlesex, ss:

CAMBRIDGE, *August* 7, A. D. 1840.

Received and recorded in the register of deeds for said county of Middlesex, Book 396, pages 1, 2.
Attest.

WM. S. HOWE,
Reg'r.

BSB Bayerische StaatsBibliothek
MDZ Münchener DigitalisierungsZentrum Digitale Bibliothek

Senate documents

Bd.: [345.] 1881/82, Vol. 6 = Congress 47, Sess. 1

Washington, DC 1882
Am.b. 3040-345,6
urn:nbn:de:bvb:12-bsb11547860-5